DVP-NS305/NS310/NS315/ NS405/NS410/NS415
RMT-D141A/D142A/D142O/D142P

SERVICE MANUAL

US Model
Canadian Model
DVP-NS315/NS415
AEP Model
DVP-NS305/NS310/NS405/NS410
UK Model
DVP-NS305/NS405
Russian Model
Hong Kong Model
Korea Model
Taiwan Model
Saudi Arabia Model
GA Model
Indian Model
Pakistan Model
Malaysia Model
DVP-NS305
Middle East Model
Oceania Model
DVP-NS305/NS415
PX Model
Mexico Model
Latin Model
Argentina Model
Brazilian Model
DVP-NS315

Self Diagnosis Supported model



Photo : DVP-NS415
RMT-D142A

SPECIFICATIONS

System
Laser: Semiconductor laser
Signal format system: NTSC/PAL
(To change the color system)

Audio characteristics
Frequency response: DVD VIDEO (PCM 96 kHz): 2 Hz to 44 kHz (±1.0 dB)/DVD VIDEO (PCM 48 kHz): 2 Hz to 22 kHz (±0.5 dB)/CD: 2 Hz to 20 kHz (±0.5 dB)
Signal-to-noise ratio (S/N ratio): 115 dB (LINE OUT (L/R) AUDIO jacks only)

Harmonic distortion: 0.003 %
Dynamic range: DVD VIDEO: 103 dB/CD: 99 dB
Wow and flutter: Less than detected value (±0.001% W PEAK)

The signals from LINE OUT L/R (AUDIO) jacks are measured. When you play PCM sound tracks with a 96 kHz sampling frequency, the output signals from the DIGITAL OUT (OPTICAL or COAXIAL) jack are converted to 48 kHz sampling frequency.

Outputs/Inputs (DVP-NS315/NS415)
Outputs (DVP-NS305/NS310/NS405/NS410)
(**Jack name:** Jack type/Output or Input level/ Load impedance)
LINE IN (AUDIO)*: Phono jack/–/47 kilohms (DVP-NS315/NS415)
LINE OUT (AUDIO): Phono jack/2 Vrms/ Over 10 kilohms
DIGITAL OUT (OPTICAL)*: Optical output jack/–18 dBm (wave length: 660 nm)
DIGITAL OUT (COAXIAL): Phono jack/ 0.5 Vp-p/75 ohms
COMPONENT VIDEO OUT(Y, P_B, P_R): Phono jack/Y: 1.0 Vp-p/P_B, P_R: 0.7 Vp-p/ 75 ohms (DVP-NS315/NS415)
LINE IN (VIDEO)*: Phono jack/1.0 Vp-p/ 75 ohms (DVP-NS315/NS415)
LINE OUT (VIDEO): Phono jack/1.0 Vp-p/ 75 ohms
S VIDEO OUT: 4-pin mini DIN/Y: 1.0 Vp-p, C: 0.286 Vp-p/75 ohms
* DVP-NS405/NS410/NS415 only

General
Power requirements: 120 V AC, 60 Hz/ 110 to 240V AC, 50/60 Hz
See page 1-1 for further information.
Power consumption: 12 W/13 W
See page 1-1 for further information.
Dimensions (approx.): 430 × 62 × 255 mm ($17 \times 2\frac{1}{2} \times 10\frac{1}{8}$ in.) (width/height/ depth) incl. projecting parts
Mass (approx.): 2.3 kg ($5\frac{5}{64}$ lb)
Operating temperature: 5 °C to 35 °C (41 °F to 95 °F)
Operating humidity: 25 % to 80 %

Supplied accessories
See page 1-3.

Specifications and design are subject to change without notice.

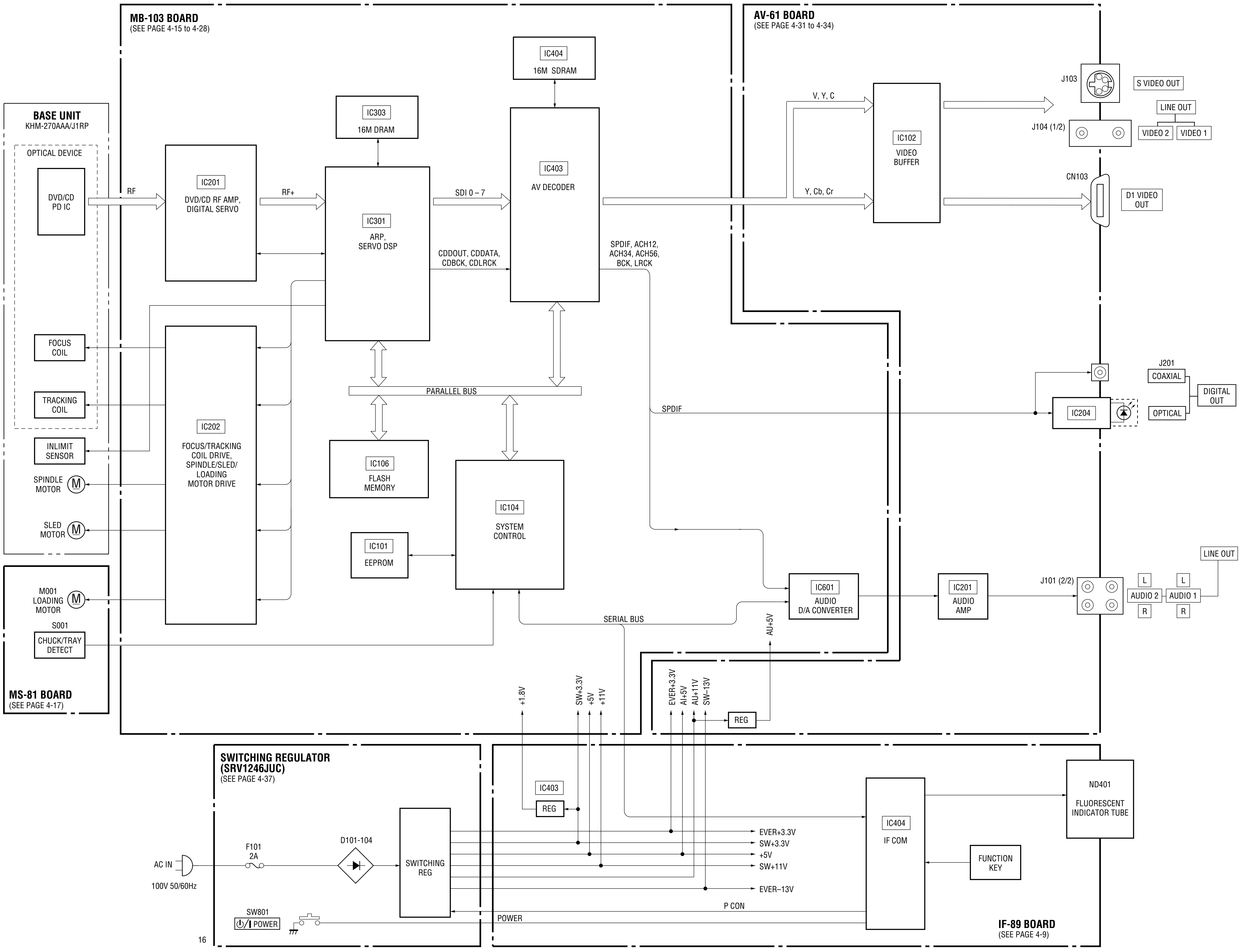
ENERGY STAR® is a U.S. registered mark. As an ENERGY STAR® Partner, Sony Corporation has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

CD/DVD PLAYER

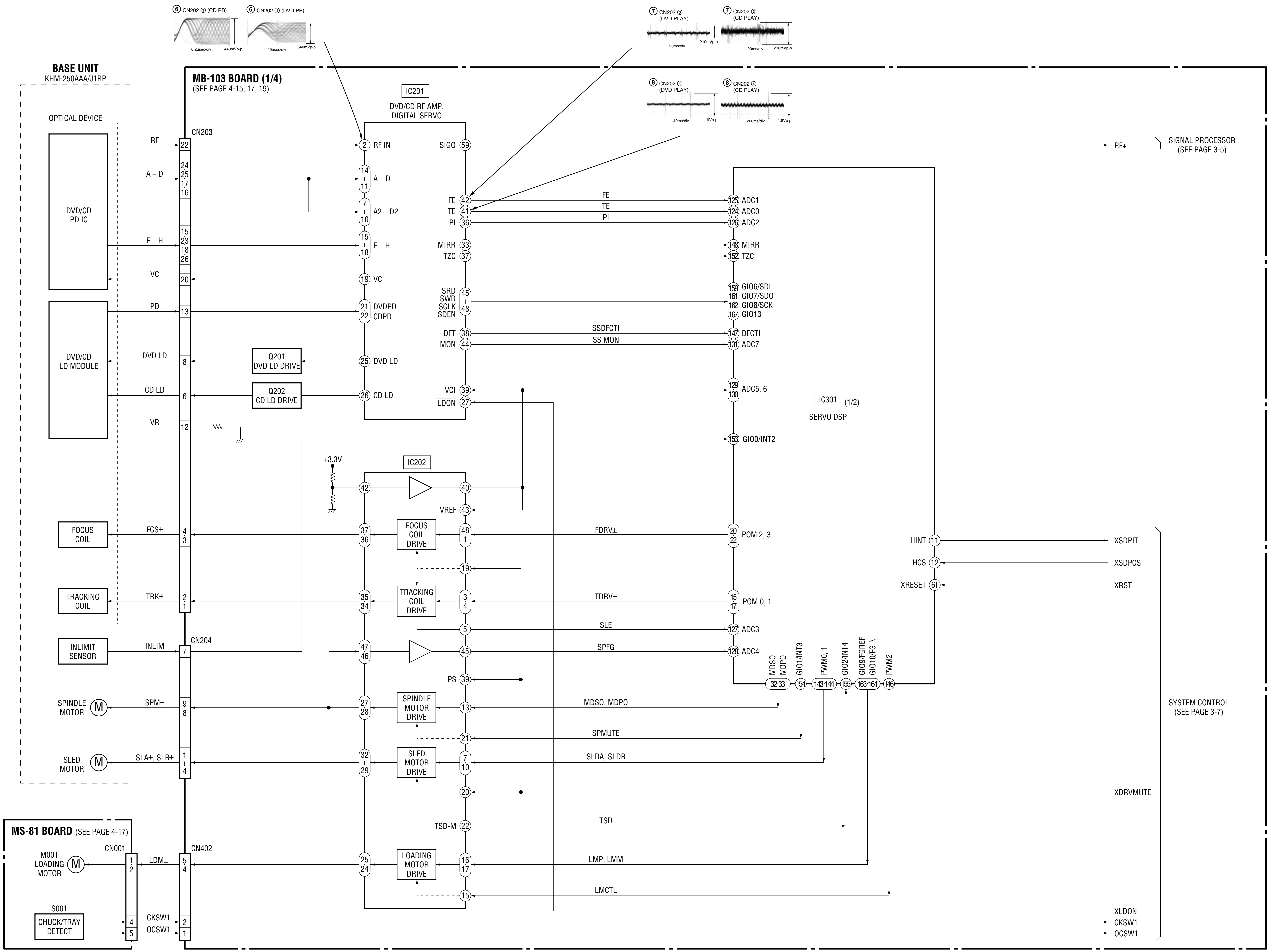
SONY®

SECTION 3
BLOCK DIAGRAMS

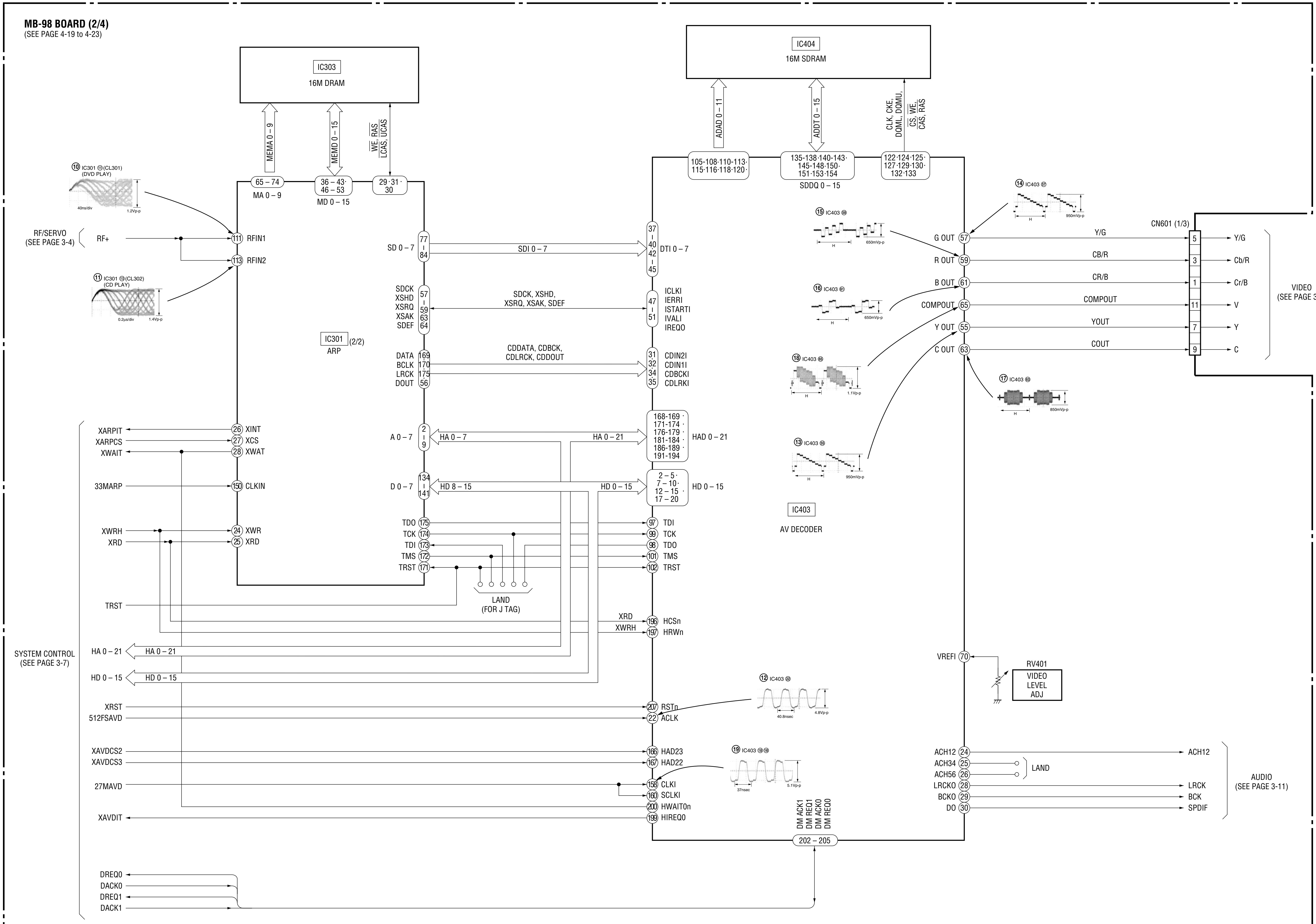
3-1. OVERALL BLOCK DIAGRAM



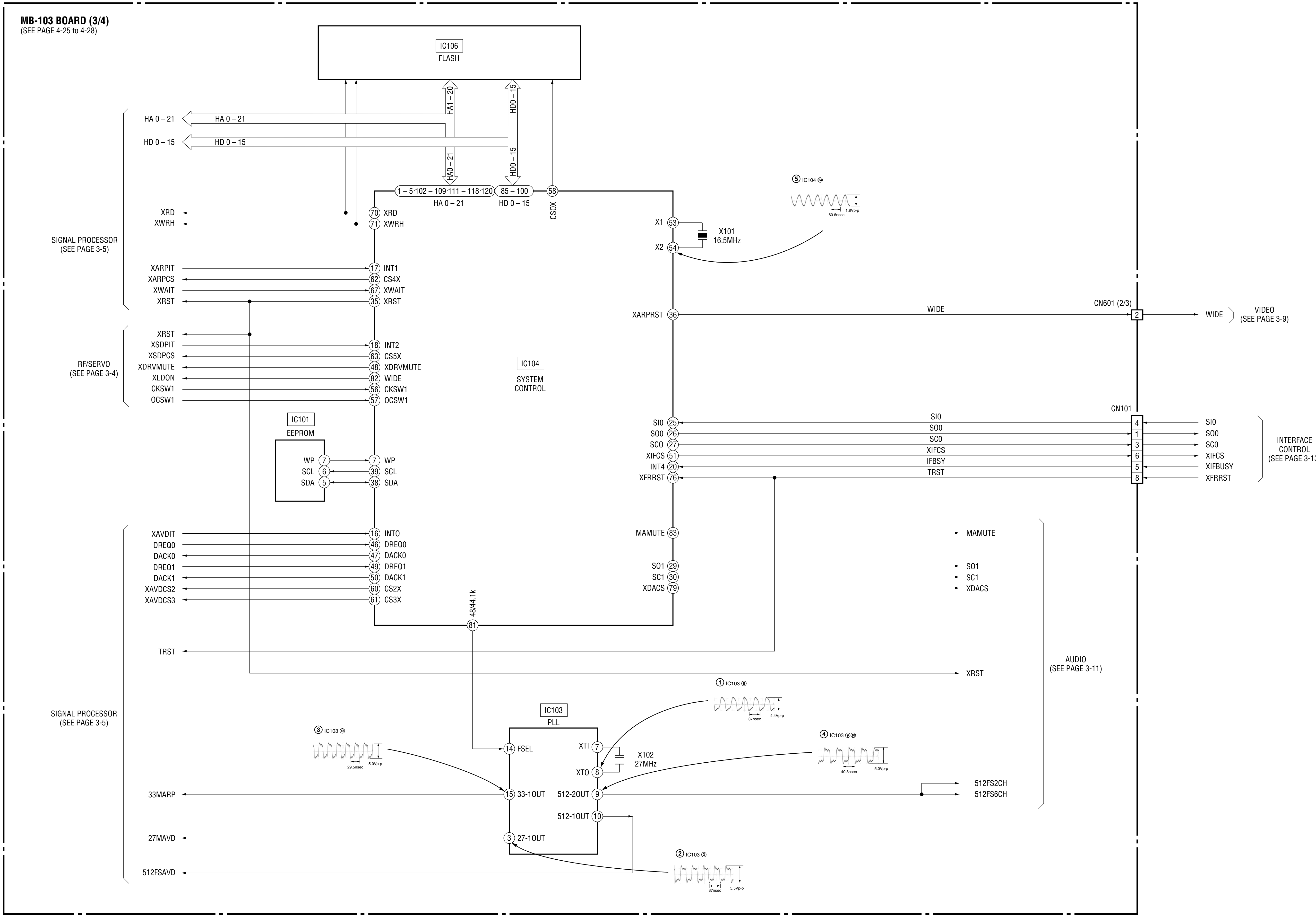
3-2. RF/SERVO BLOCK DIAGRAM



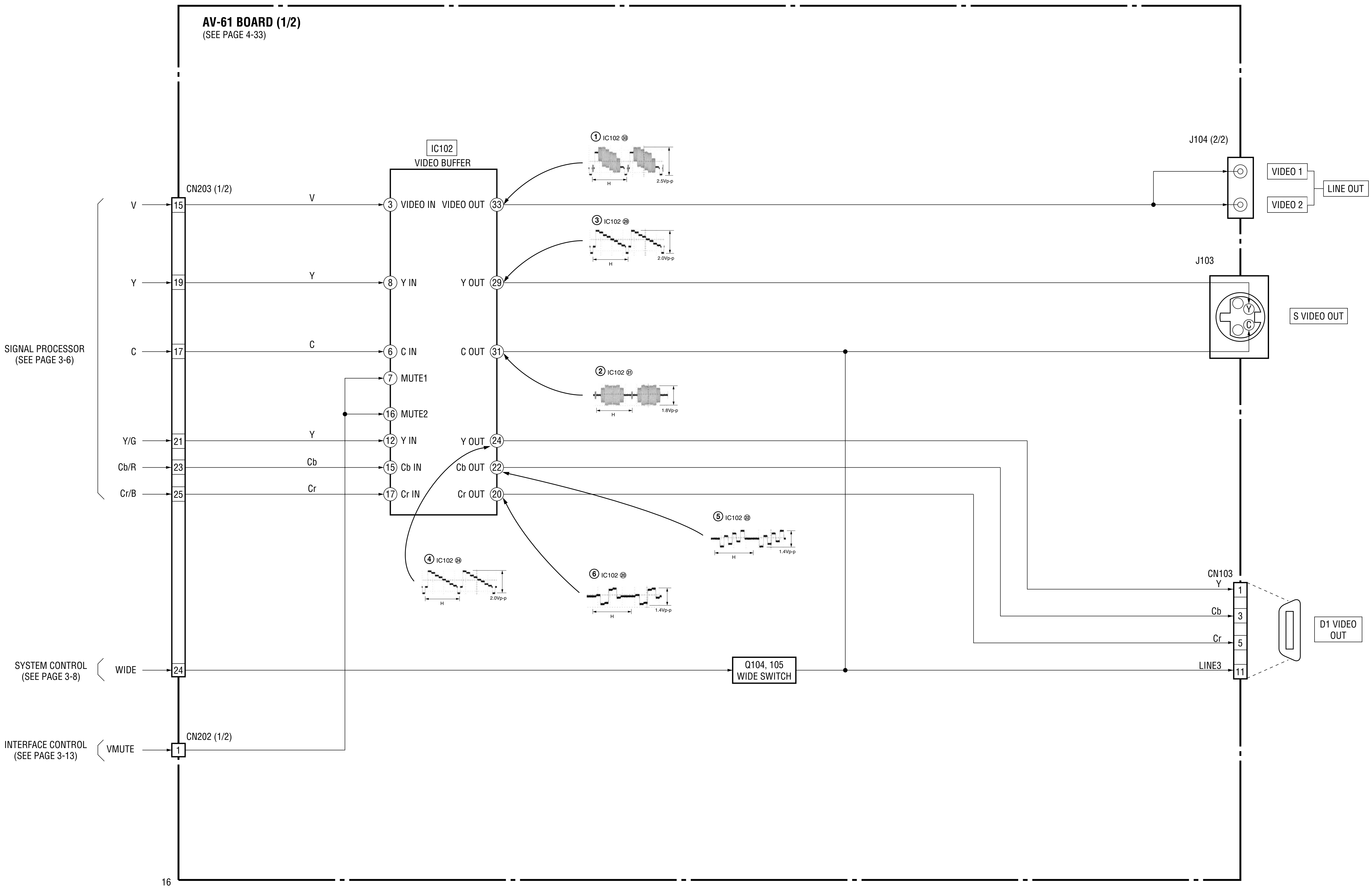
3-3. SIGNAL PROCESSOR BLOCK DIAGRAM



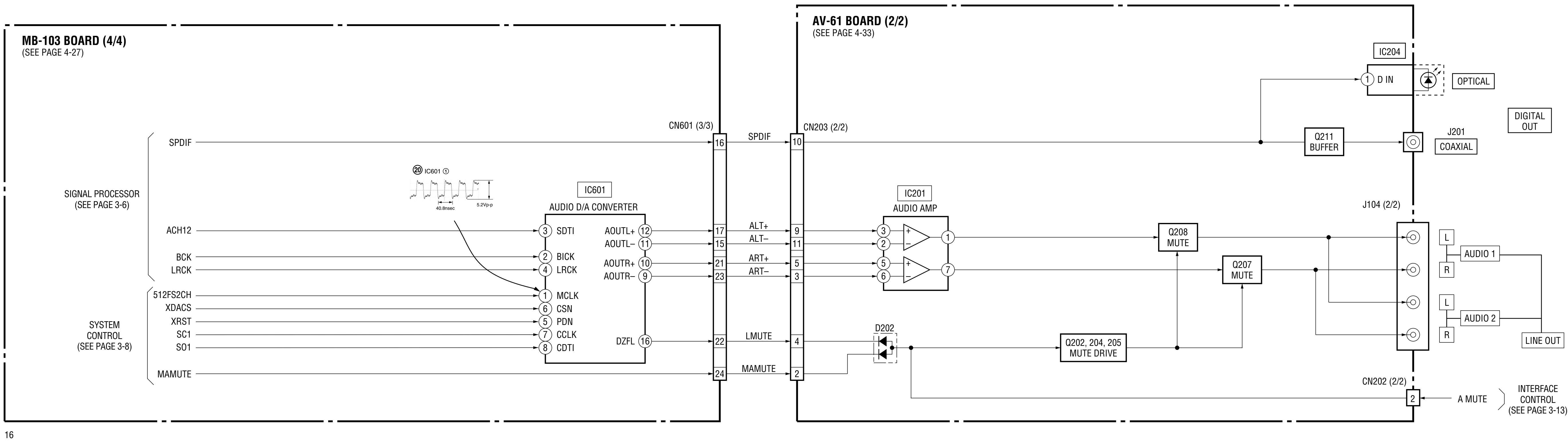
3-4. SYSTEM CONTROL BLOCK DIAGRAM



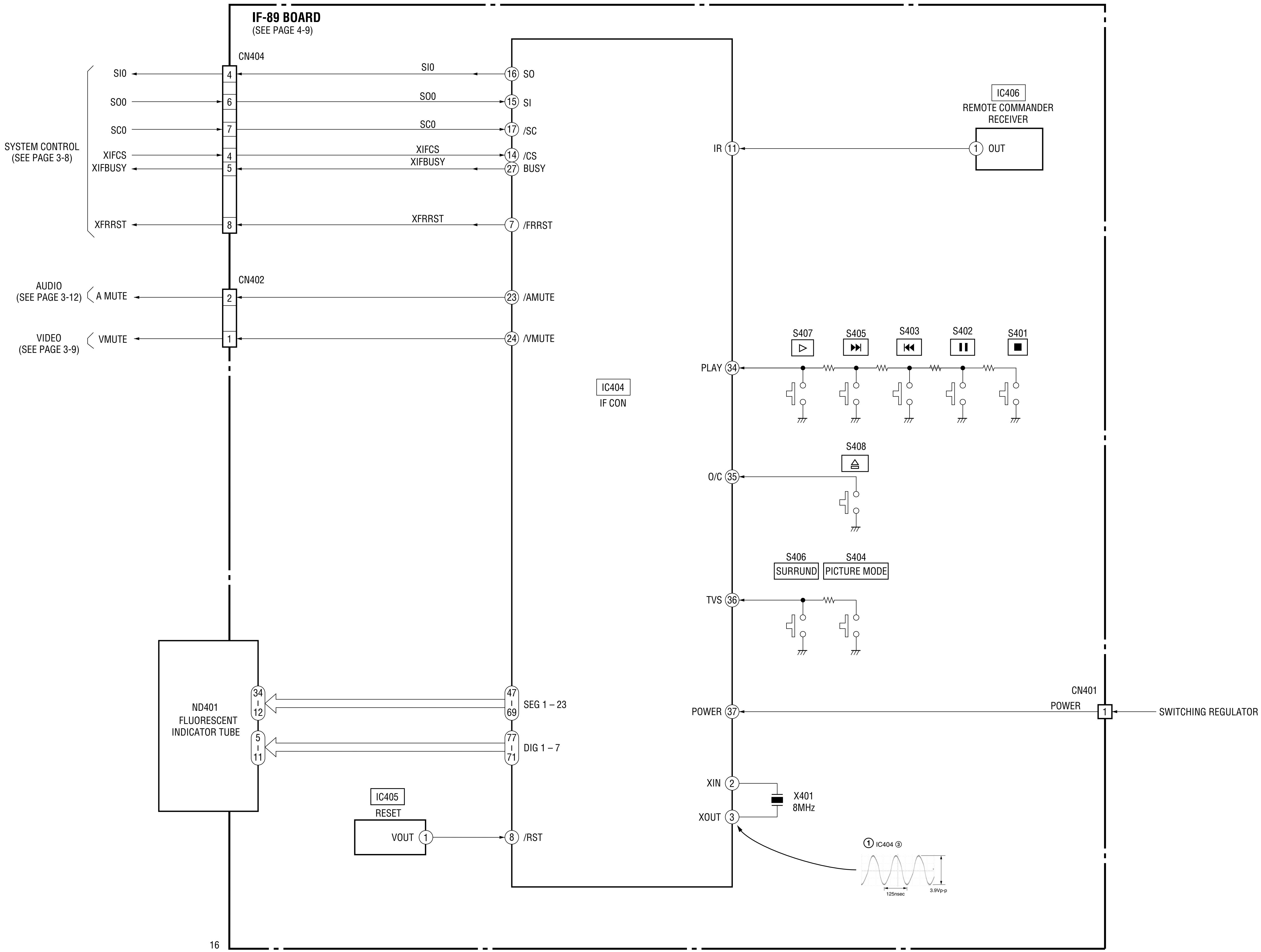
3-5. VIDEO BLOCK DIAGRAM



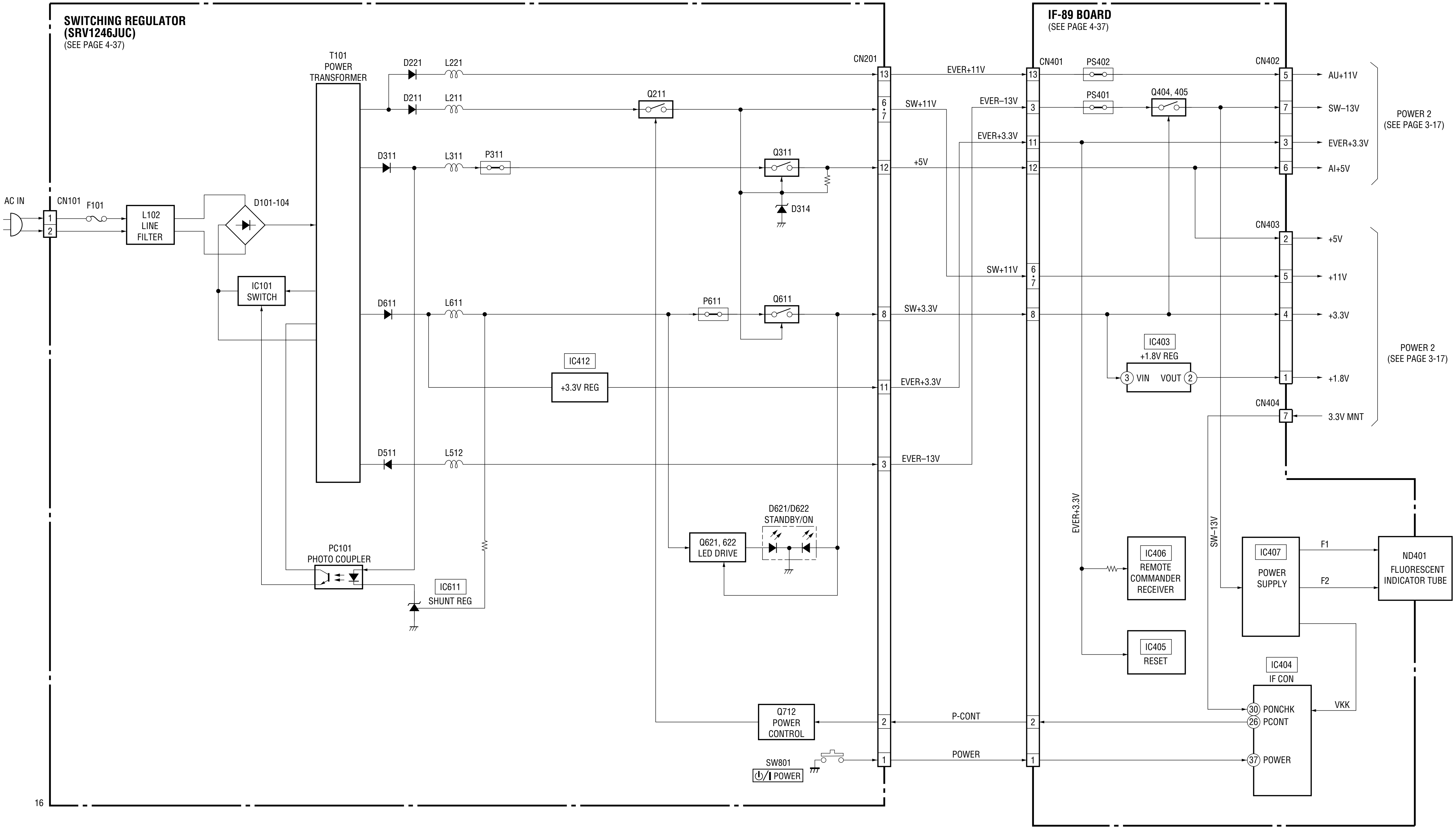
3-6. AUDIO BLOCK DIAGRAM



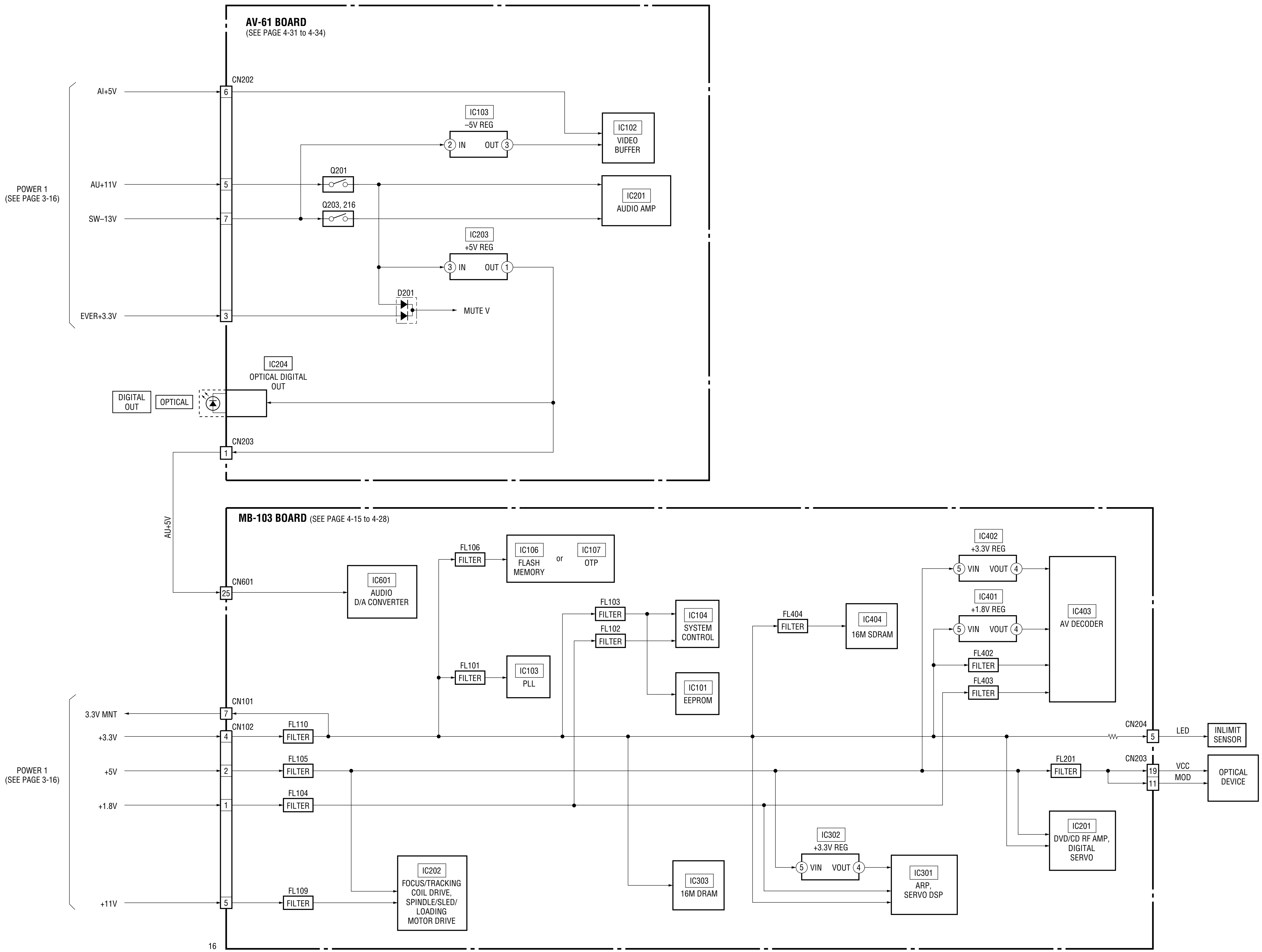
3-7. INTERFACE CONTROL BLOCK DIAGRAM



3-8. POWER BLOCK DIAGRAM (1/2)

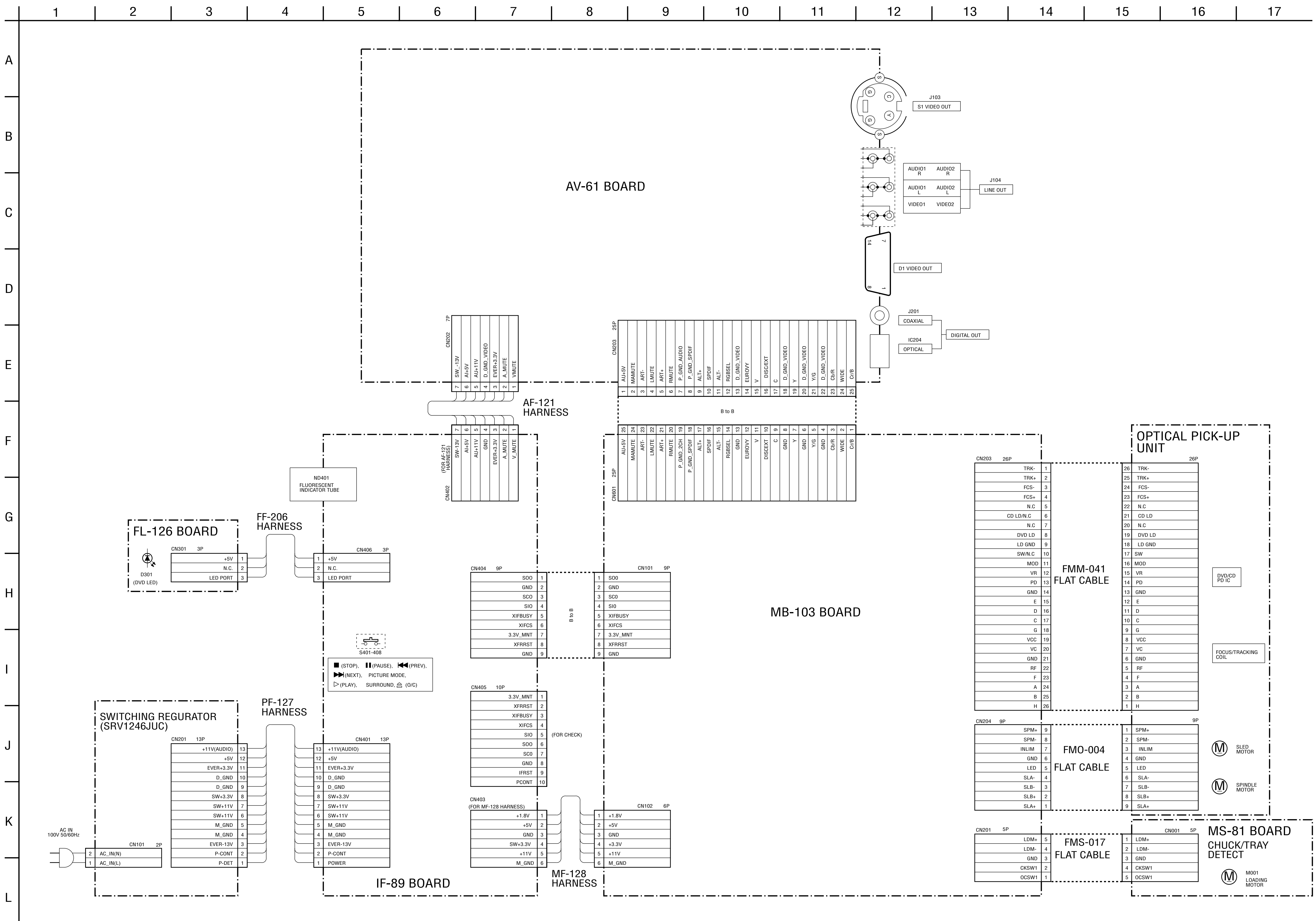


3-9. POWER BLOCK DIAGRAM (2/2)



SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR WIRING BOARDS AND SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

(For printed wiring boards)
- o——— : indicates a lead wire mounted on the component side.
- ●——— : indicates a lead wire mounted on the printed side.
- ○ : Through hole.
- ░░░ : Pattern from the side which enables seeing.
  (The other layers' patterns are not indicated.)

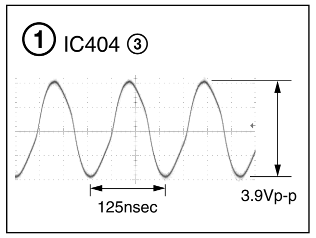
Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

(For schematic diagrams)
- All capacitors are in μF unless otherwise noted. pF : μμF. 50V or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, 1/4 W (Chip resistors : 1 /10 W) un-less otherwise specified.
  kΩ=1000Ω, MΩ=1000kΩ.
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, be-cause it is damaged by the heat.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : non flammable resistor
- : fusible resistor
- : panel designation
- Δ : internal component.
- : adjustment for repair.
- B+ : B+ Line
- B– : B– Line
- Circled numbers refer to waveforms.
- Voltages are dc between measurement point.
- Readings are taken with a color-bar signals on DVD refer-ence disc and when playing CD reference disc.
- Readings are taken with a digital multimeter (DC 10MW).
- Voltage variations may be noted due to normal production toler-ances.

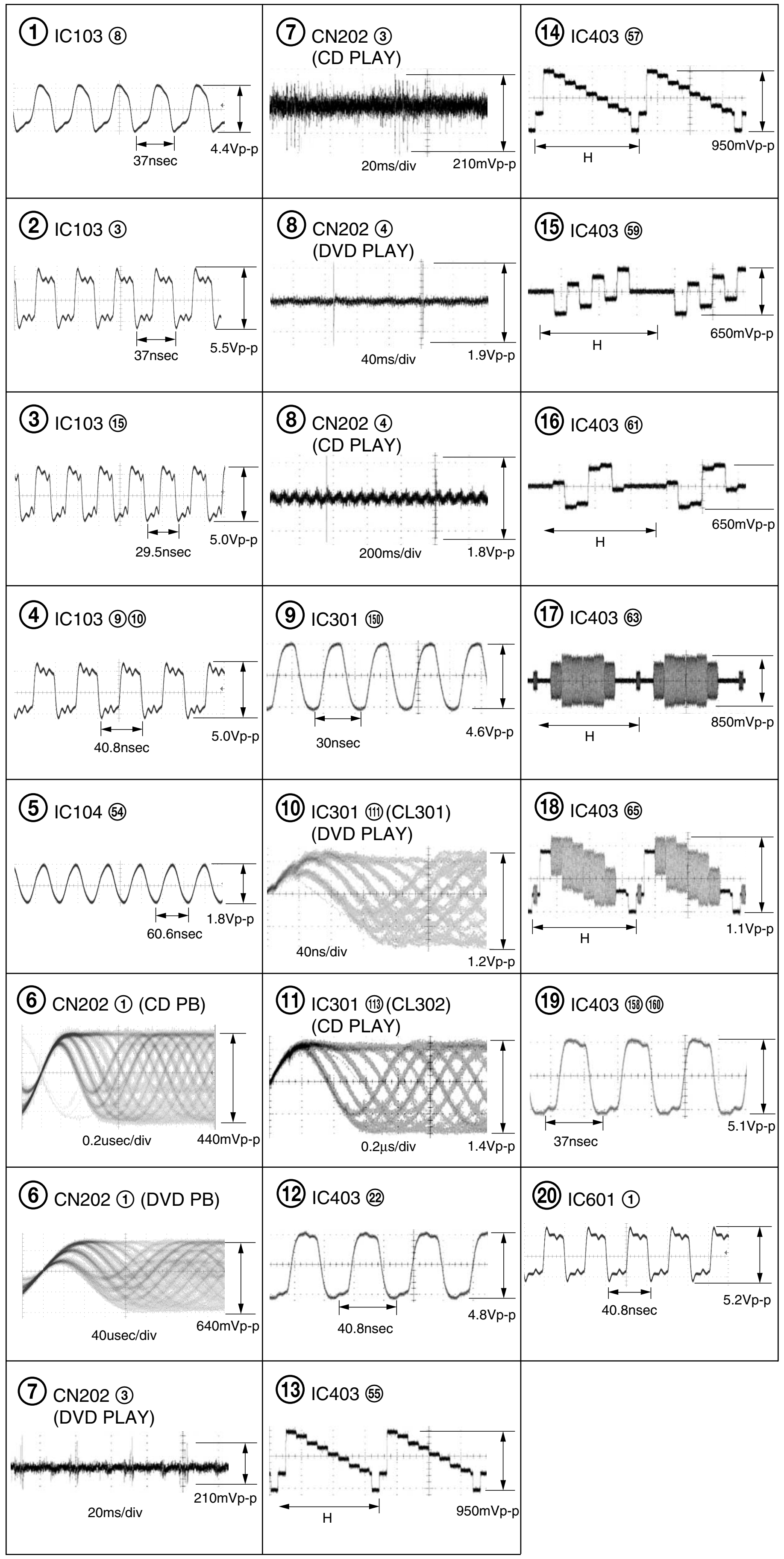
Note :	Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, pleas include the board name.

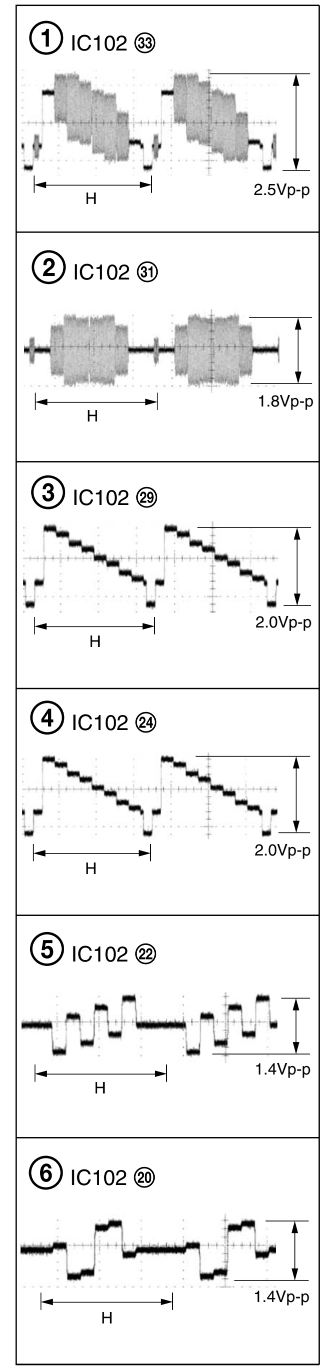
IF-089 BOARD



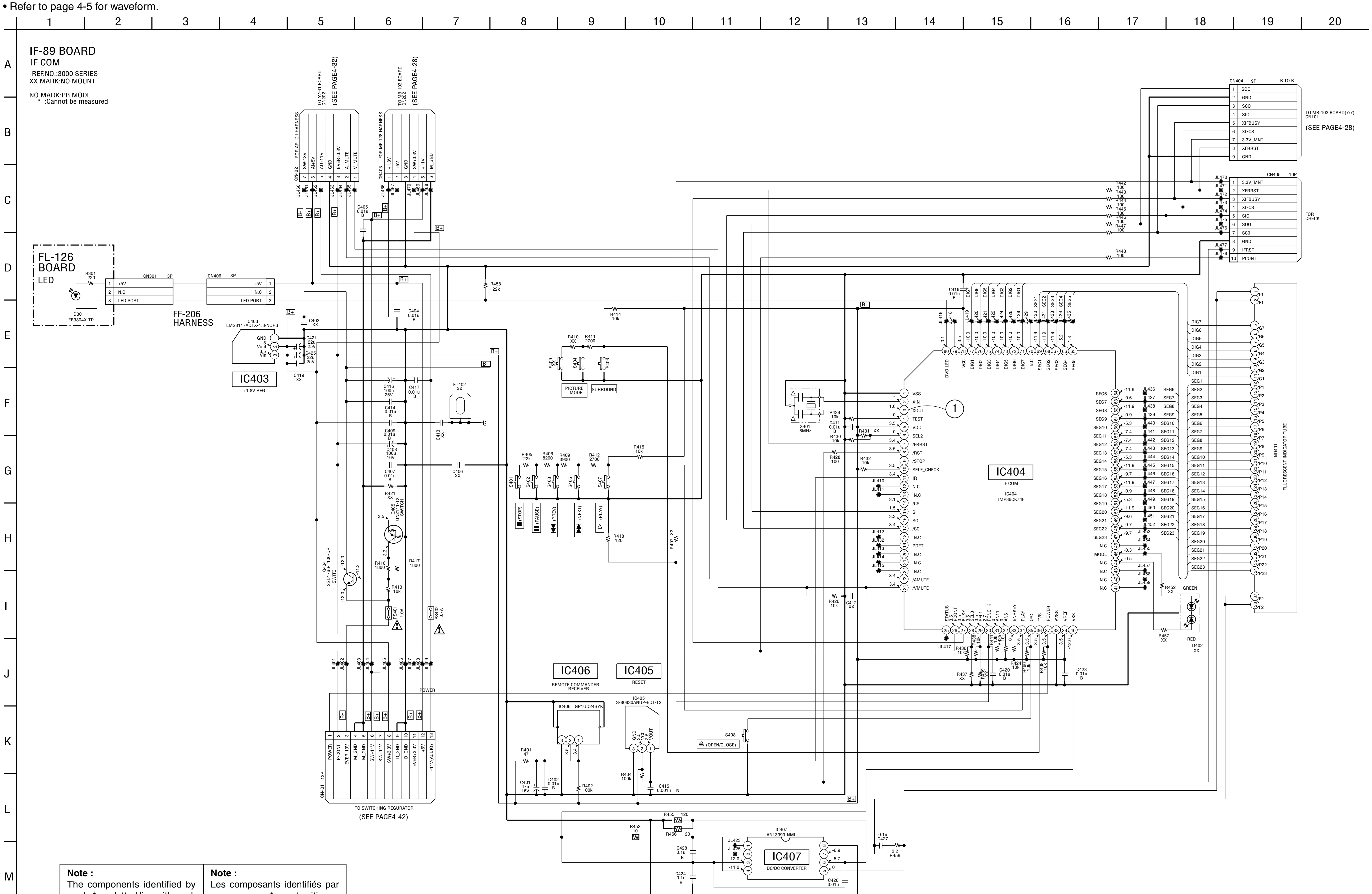
MB-103 BOARD



AV-61 BOARD



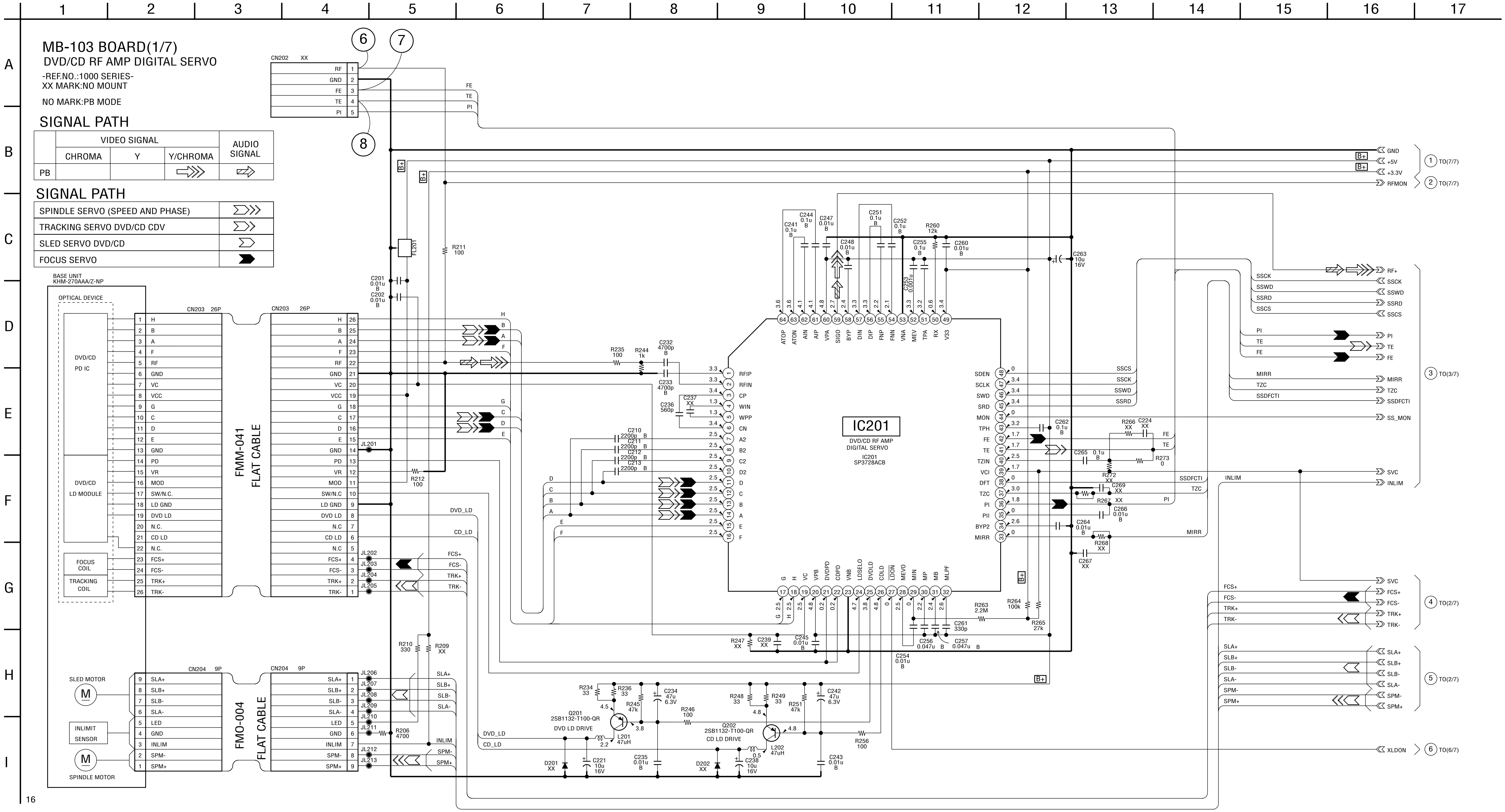
For Schematic Diagram
- Refer to page 4-7 for printed wiring board.
- Refer to page 4-5 for waveform.



Note :	Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

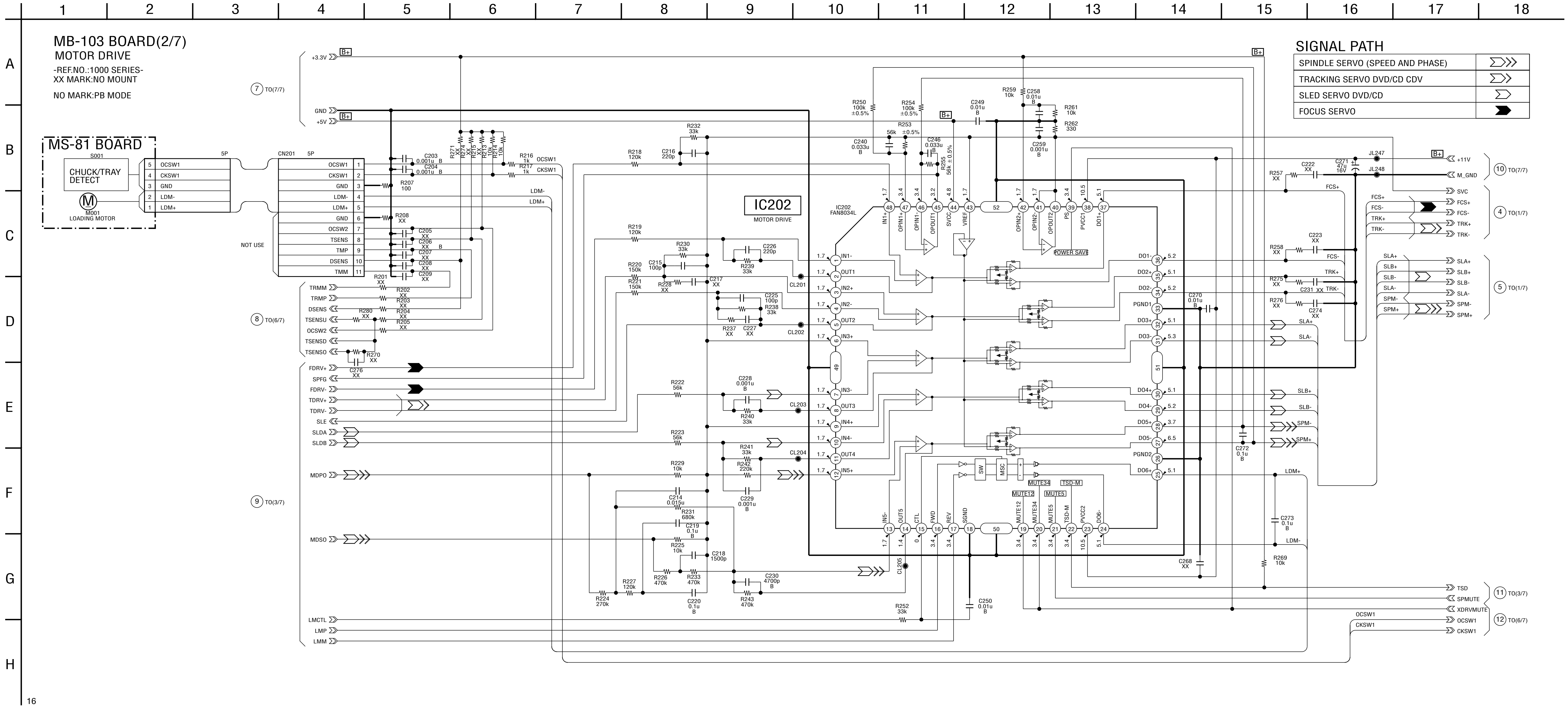
16

For Schematic Diagram
- Refer to page 4-11 for printed wiring board.
- Refer to page 4-5 for waveforms.



For Schematic Diagram

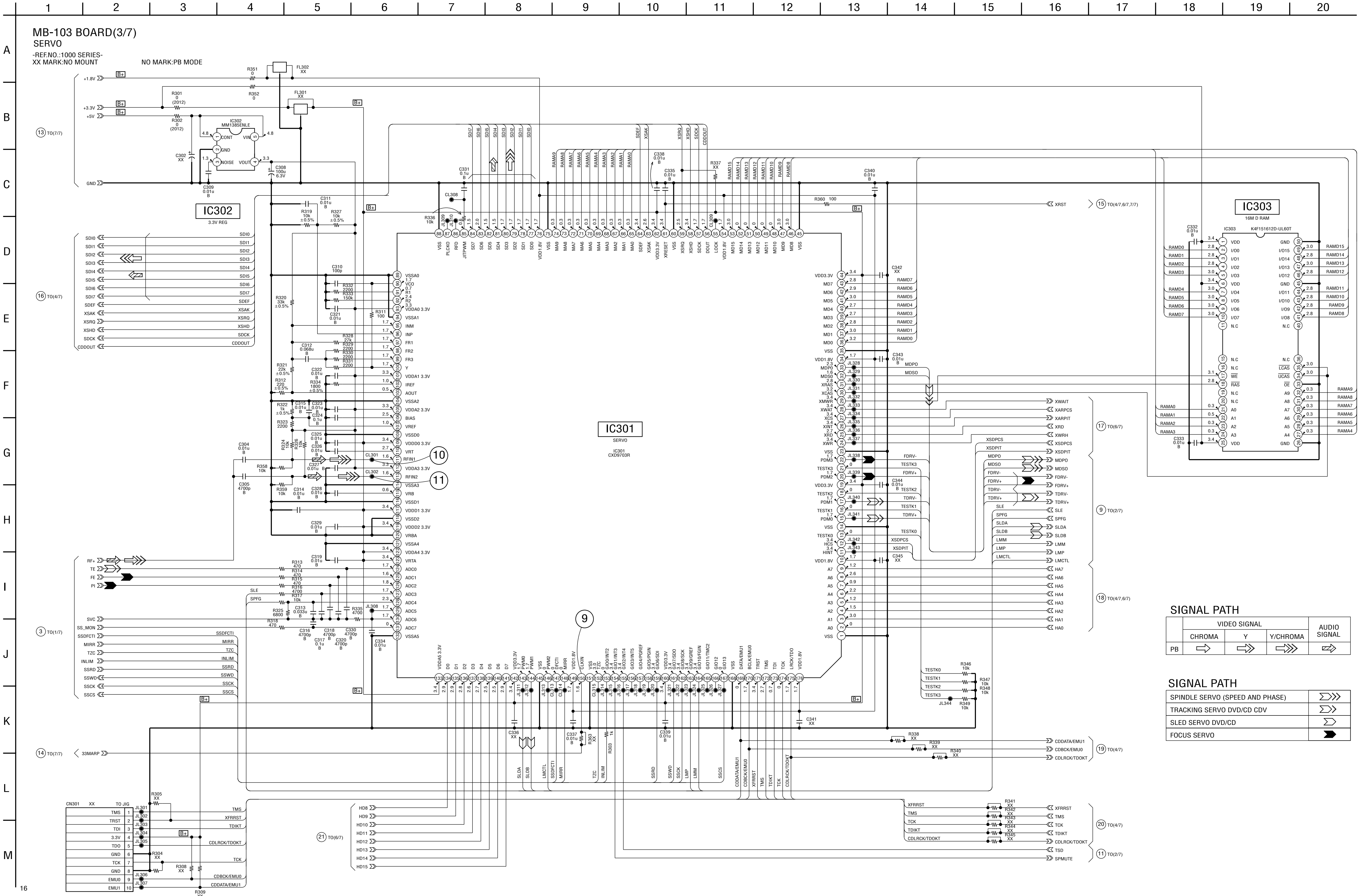
- Refer to page 4-11 for printed wiring board.



MOTOR DRIVE

MB-103 (2/7)

For Schematic Diagram
- Refer to page 4-11 for printed wiring board.
- Refer to page 4-5 for waveforms.



SIGNAL PATH

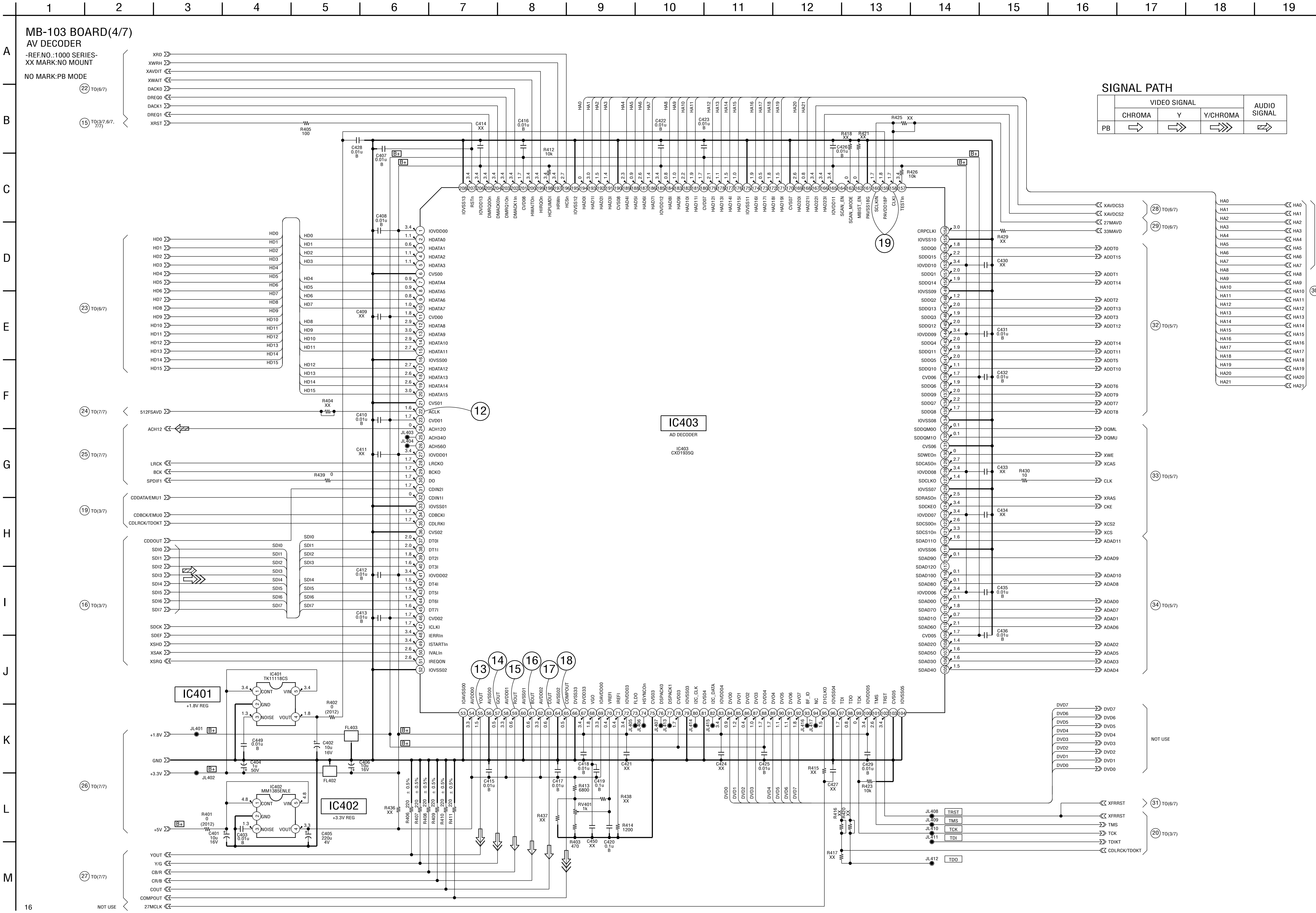
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB	⇨	⇨⟩⟩	⇨⟩⟩⟩	⇨

SIGNAL PATH

SPINDLE SERVO (SPEED AND PHASE)	⟩⟩⟩
TRACKING SERVO DVD/CD CDV	⟩⟩
SLED SERVO DVD/CD	⟩
FOCUS SERVO	➤

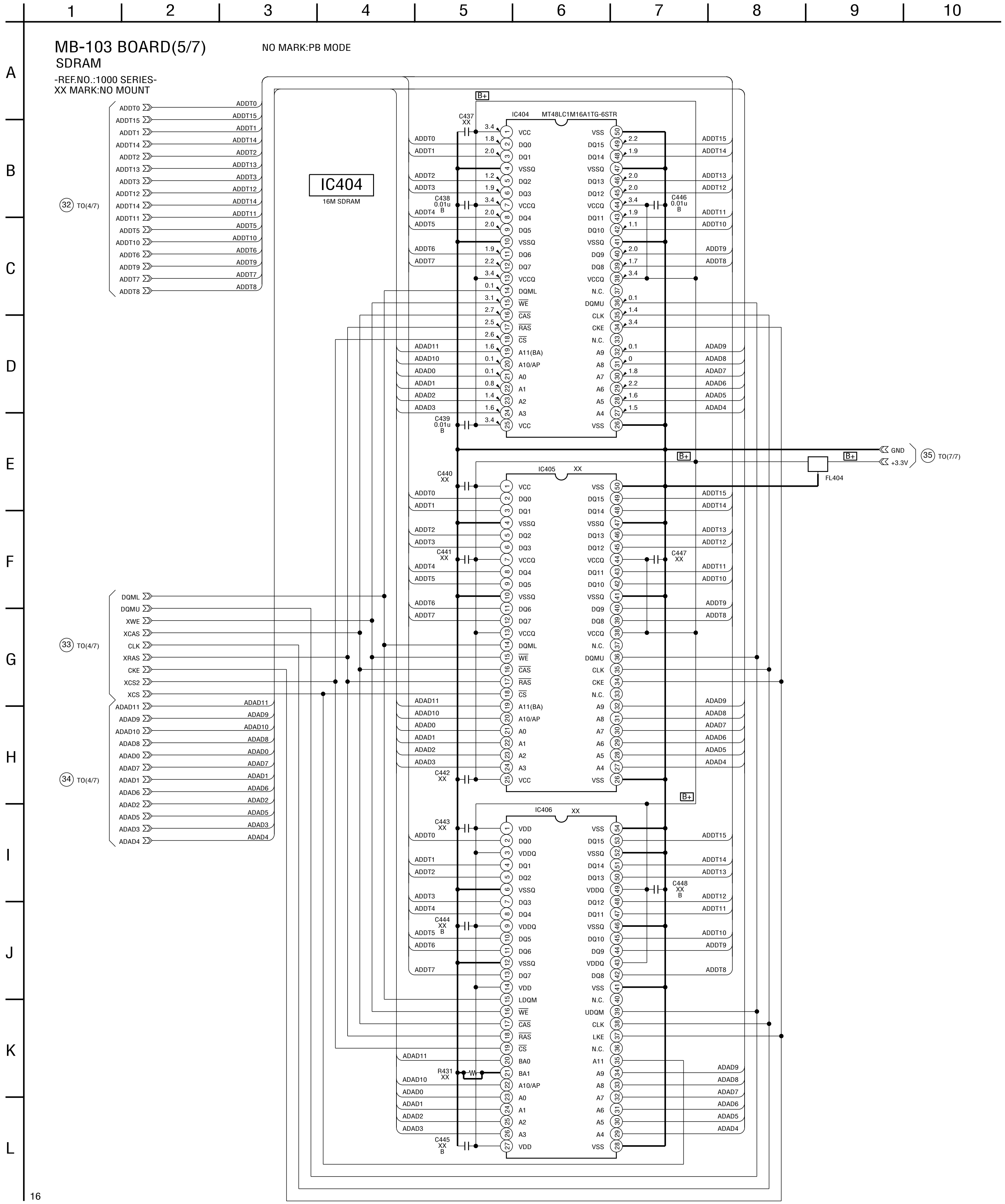
For Schematic Diagram

- Refer to page 4-11 for printed wiring board.
- Refer to page 4-5 for waveforms.

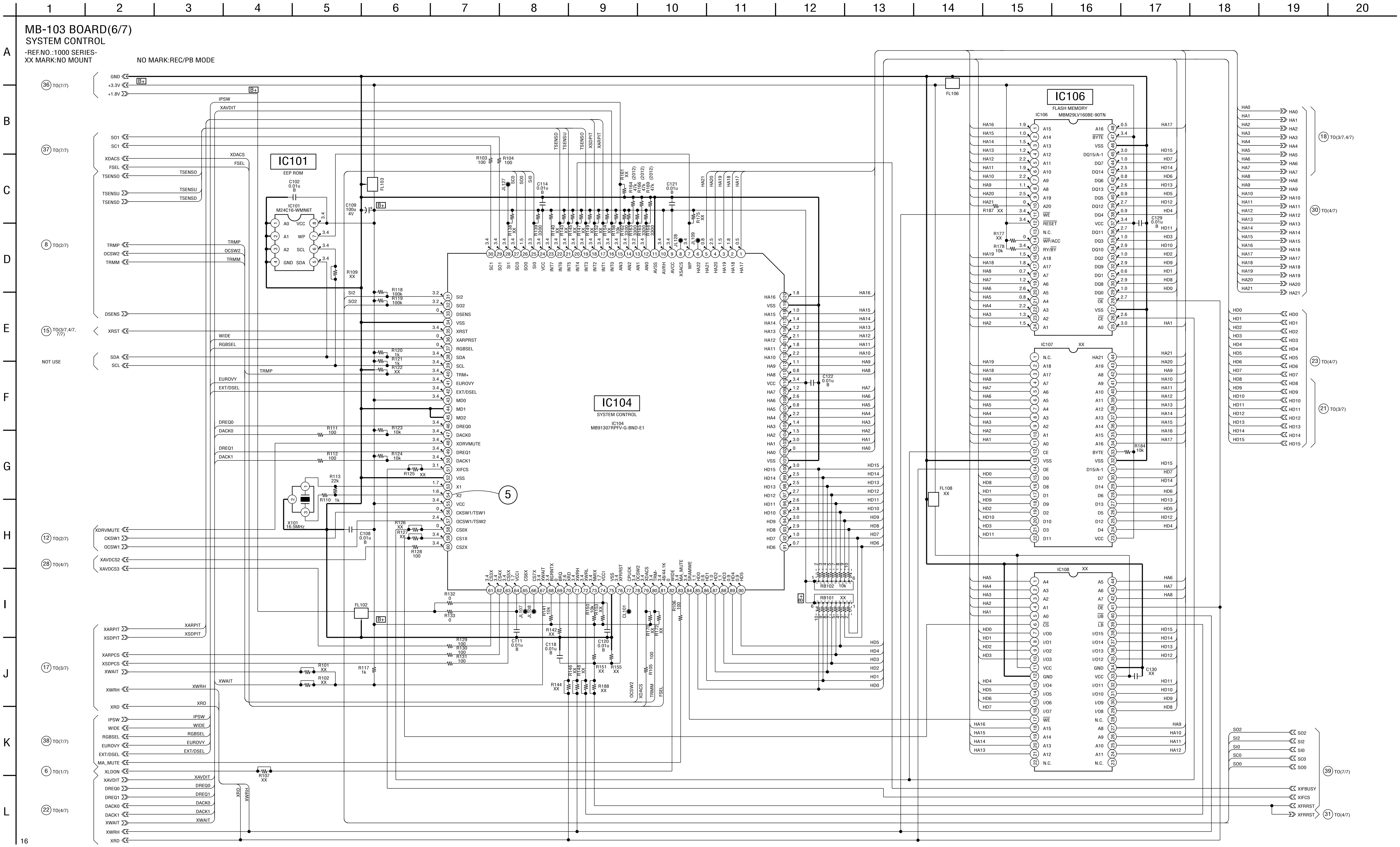


AV DECODER
MB-103 (4/7)

For Schematic Diagram
• Refer to page 4-11 for printed wiring board.

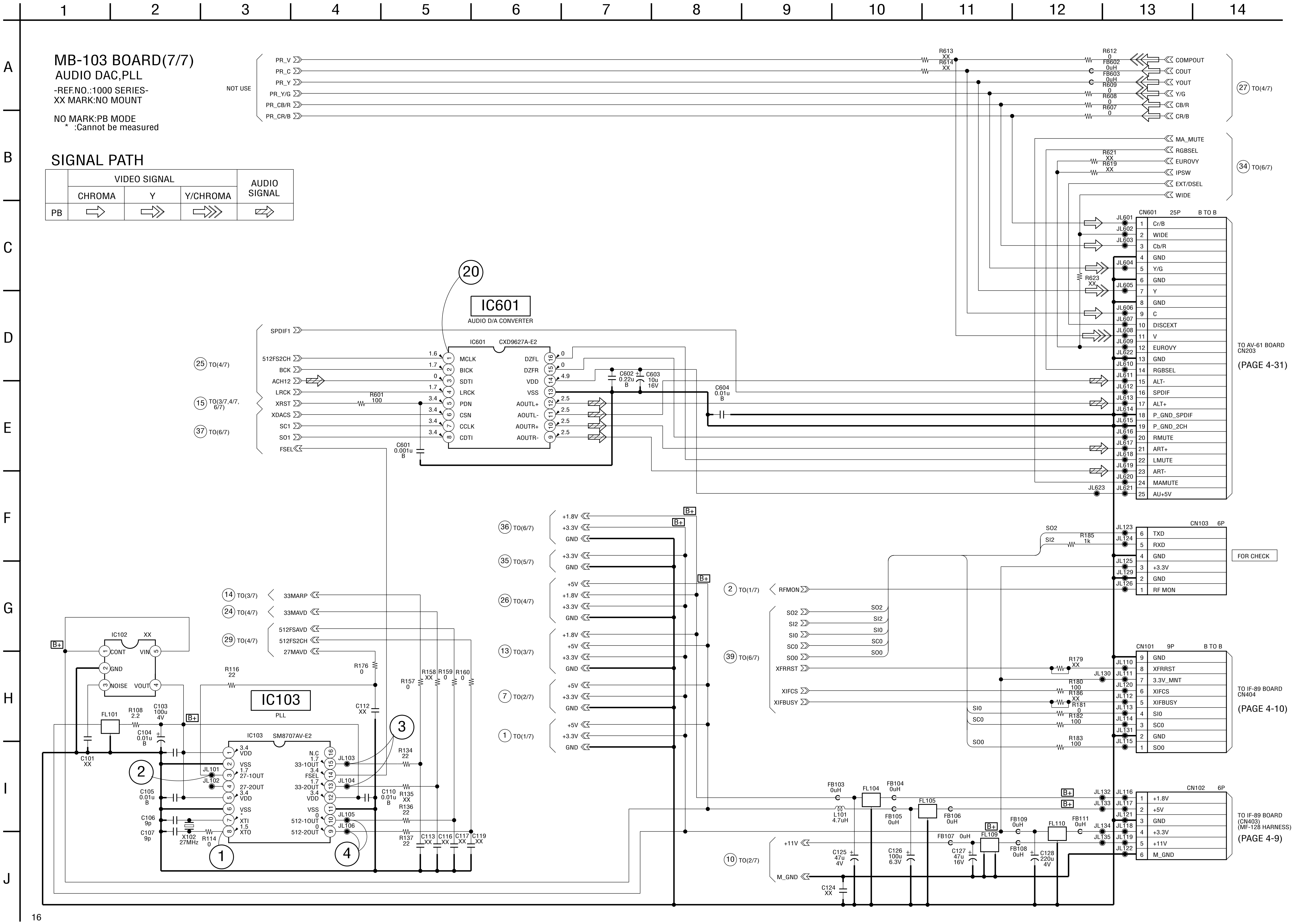


For Schematic Diagram
- Refer to page 4-11 for printed wiring board.
- Refer to page 4-5 for waveform.



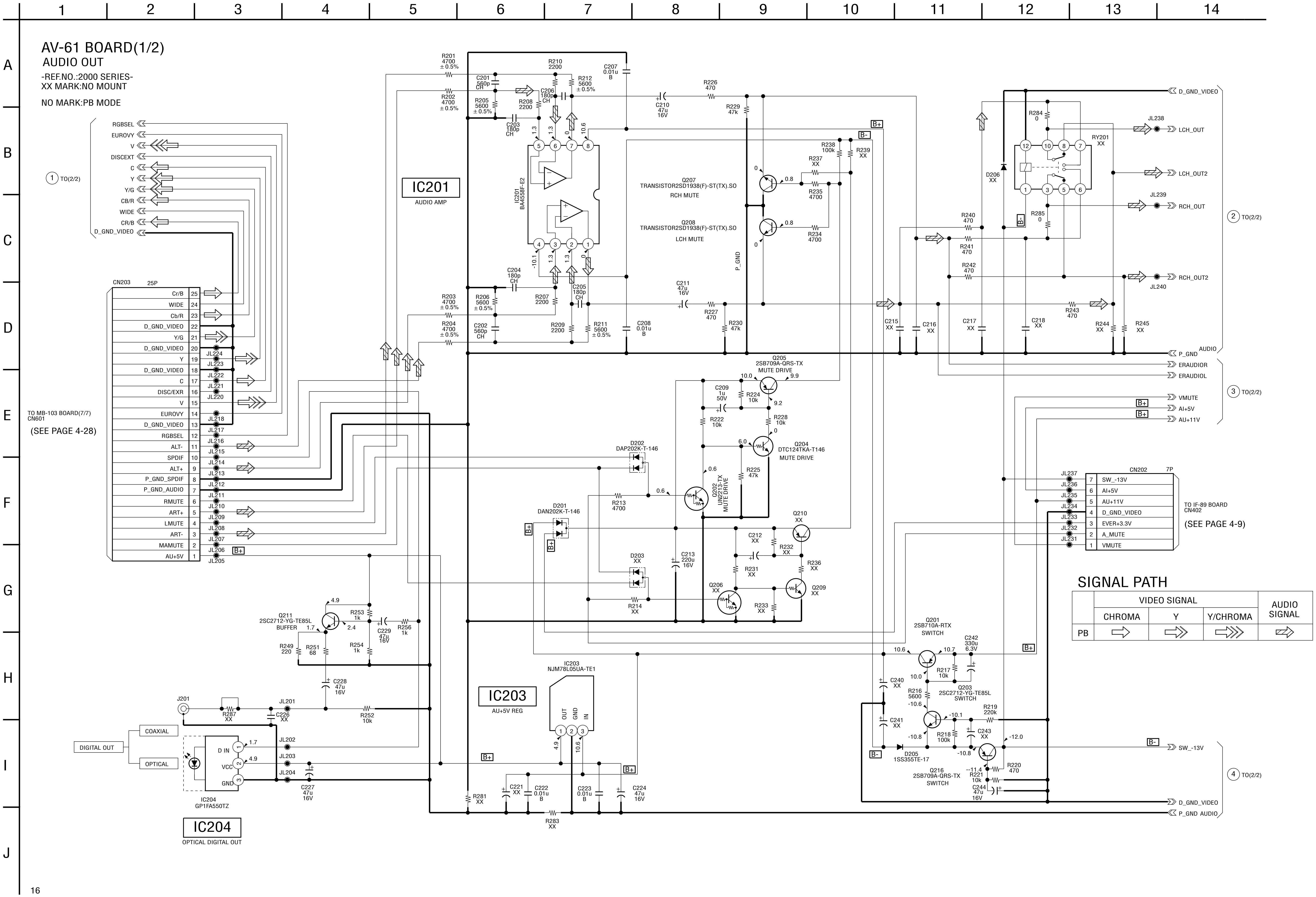
SYSTEM CONTROL
MB-103 (6/7)

For Schematic Diagram
- Refer to page 4-11 for printed wiring board.
- Refer to page 4-5 for waveforms.



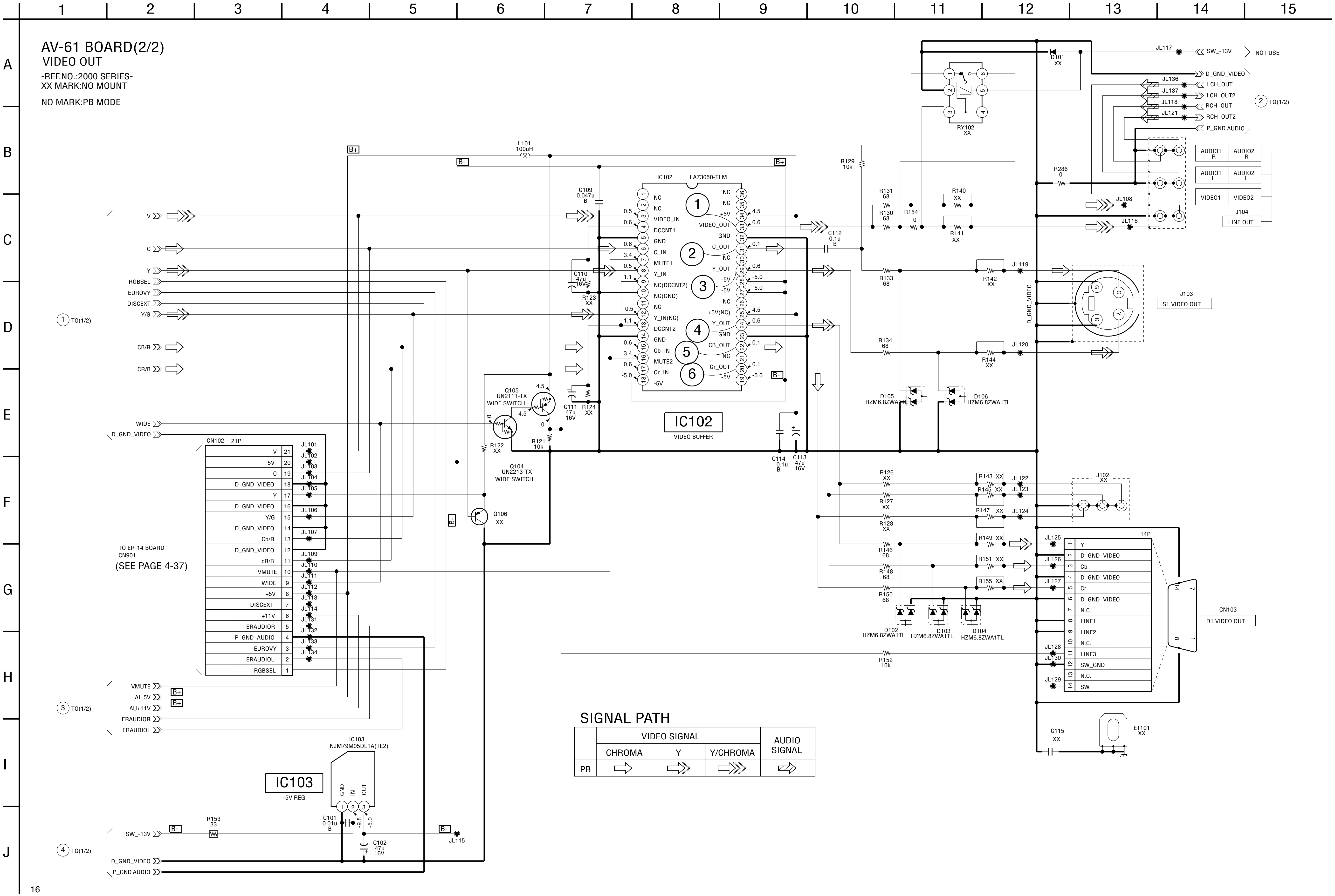
16

For Schematic Diagram
• Refer to page 4-29 for printed wiring board.



	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB	⇨	⇨⇨	⇨⇨⇨	⇨

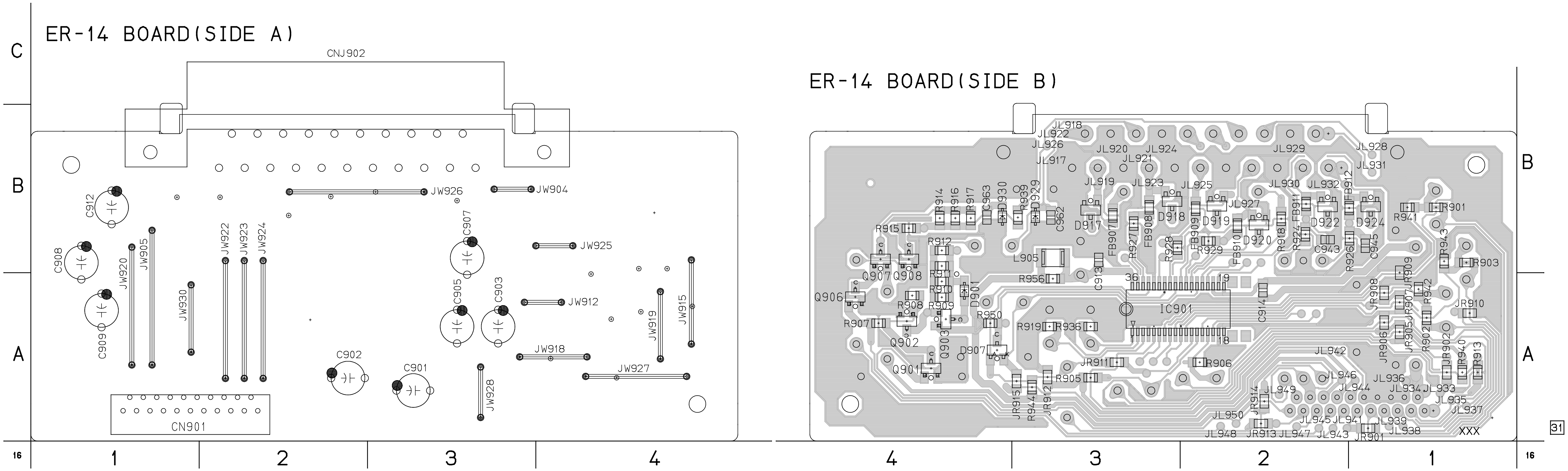
For Schematic Diagram
- Refer to page 4-29 for printed wiring board.
- Refer to page 4-6 for waveforms.



VIDEO OUT
AV-61 (2/2)

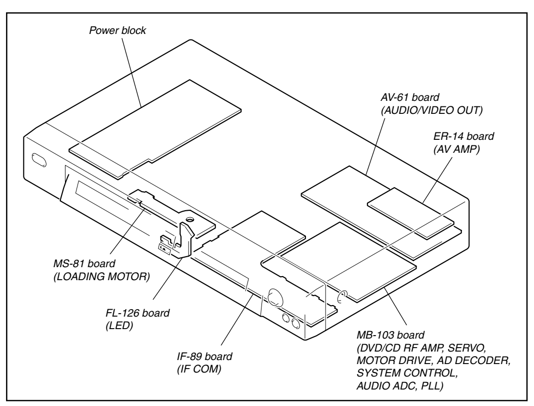
ER-14 (AV AMP) PRINTED WIRING BOARD

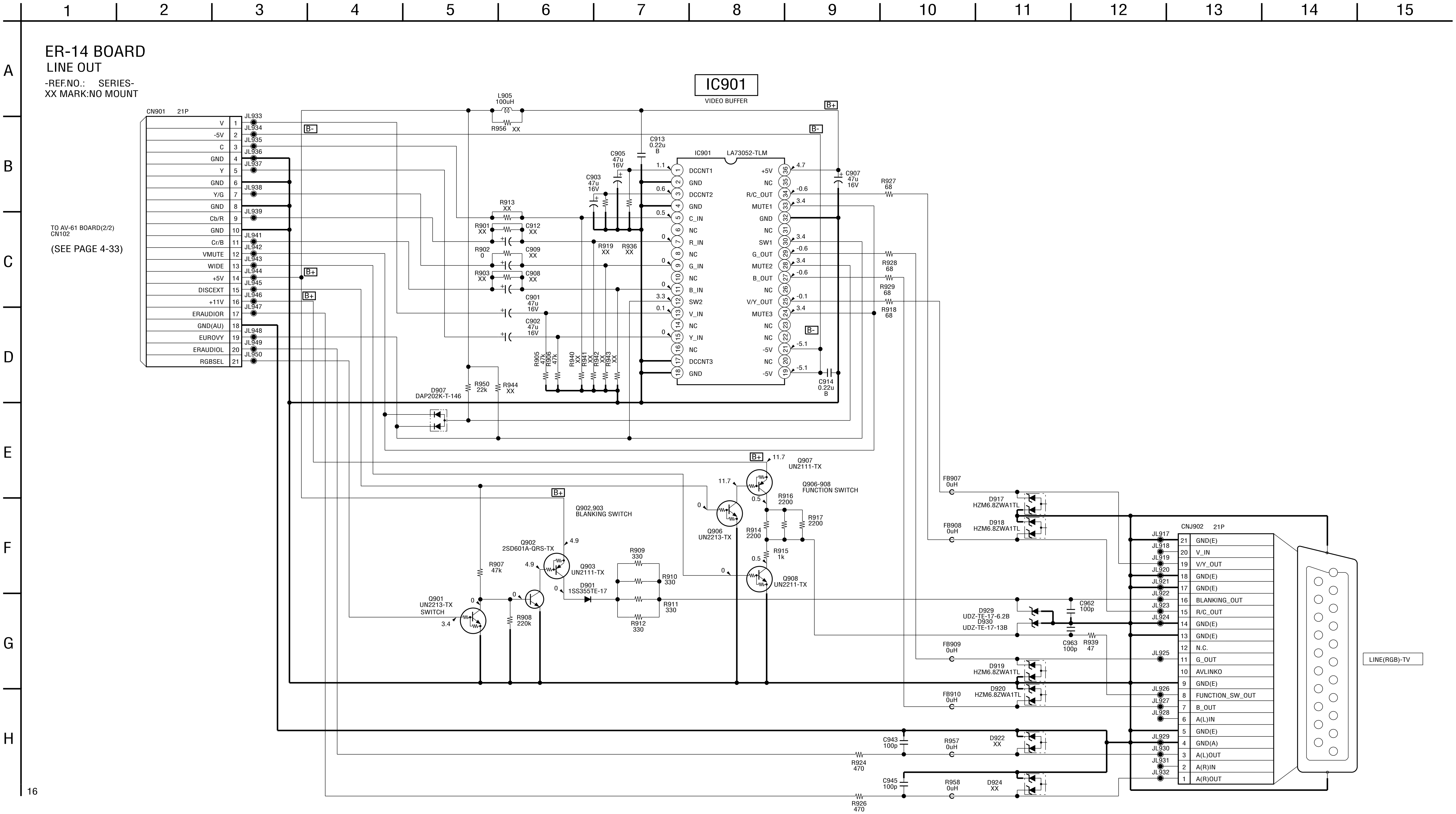
• [LF mark] : Uses unleaded solder.



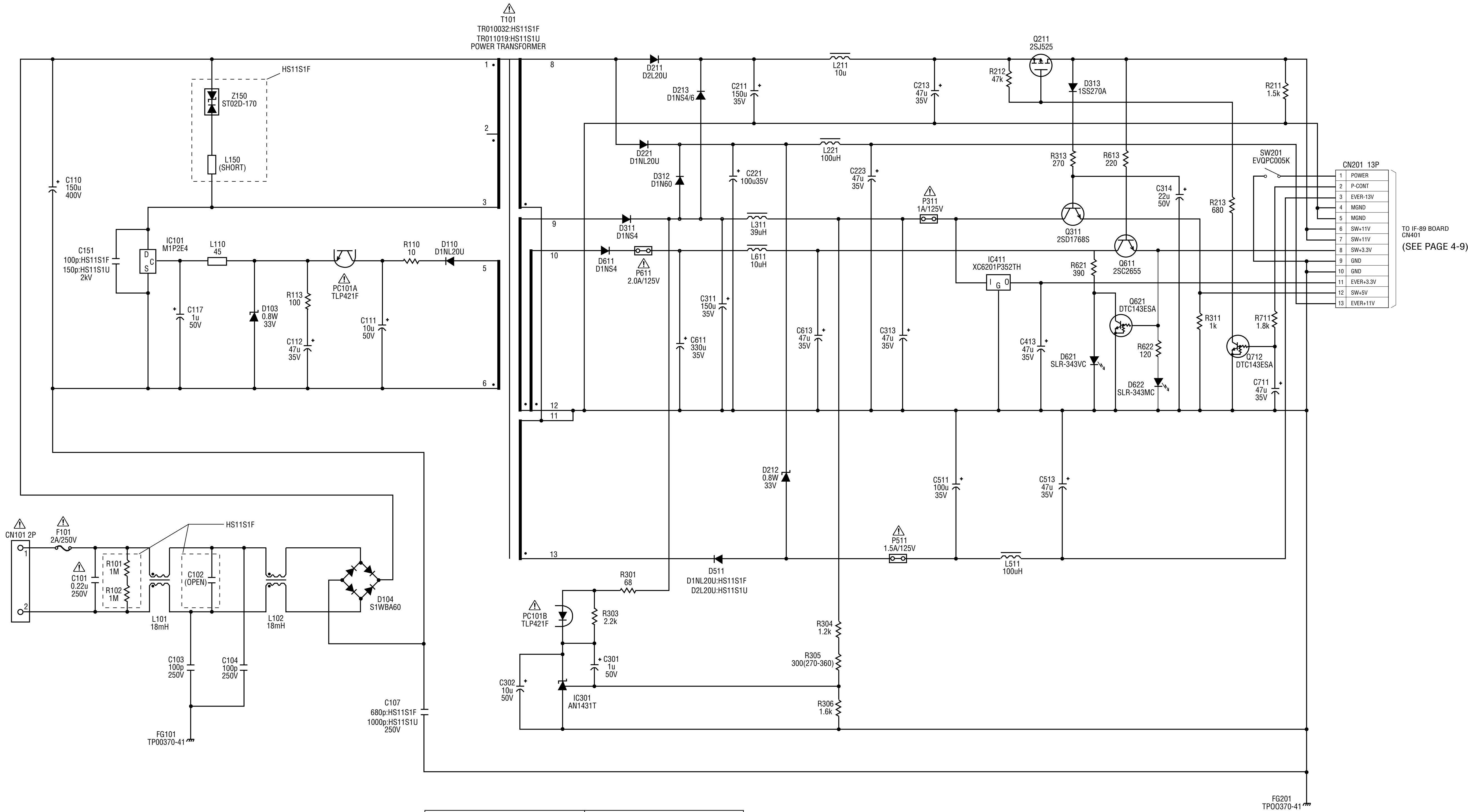
For printed wiring board

There are a few cases that the part printed on this diagram isn't mounted in this model.




ER-14 BOARD
LINE OUT
-REF.NO.: SERIES-
XX MARK:NO MOUNT
TO AV-61 BOARD(2/2) CN102
(SEE PAGE 4-33)
CN901 21P
V
-5V
C
GND
Y
GND
Y/G
GND
Cb/R
GND
Cr/B
VMUTE
WIDE
+5V
DISCEXT
+11V
ERAUDIOR
GND(AU)
EUROVY
ERAUDIOL
RGBSEL
IC901
VIDEO BUFFER
IC901 LA73052-TLM
DCCNT1
GND
DCCNT2
GND
C_IN
NC
R_IN
NC
G_IN
NC
B_IN
SW2
V_IN
NC
Y_IN
NC
DCCNT3
GND
+5V
NC
R/C_OUT
MUTE1
GND
NC
SW1
G_OUT
MUTE2
B_OUT
NC
V/Y_OUT
MUTE3
NC
NC
-5V
NC
-5V
D907 DAP202K-T-146
Q907 UN2111-TX
Q906-908 FUNCTION SWITCH
Q906 UN2213-TX
Q908 UN2211-TX
Q902,903 BLANKING SWITCH
Q902 2SD601A-QRS-TX
Q903 UN2111-TX
D901 1SS355TE-17
Q901 UN2213-TX SWITCH
D929 UDZ-TE-17-6.2B
D930 UDZ-TE-17-13B
D917 HZM6.8ZWA1TL
D918 HZM6.8ZWA1TL
D919 HZM6.8ZWA1TL
D920 HZM6.8ZWA1TL
CNJ902 21P
GND(E)
V_IN
V/Y_OUT
GND(E)
GND(E)
BLANKING_OUT
R/C_OUT
GND(E)
GND(E)
N.C.
G_OUT
AVLINKO
GND(E)
FUNCTION_SW_OUT
B_OUT
A(L)IN
GND(E)
GND(A)
A(L)OUT
A(R)IN
A(R)OUT
LINE(RGB)-TV
16

SWITCHING REGULATOR



Note :	**Note :**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SECTION 6
TEST MODE

6-1. GENERAL DESCRIPTION

The Test Mode allows you to make diagnosis and adjustment easily using the remote commander and monitor TV. The instructions, diagnostic results, etc. are given on the on-screen display (OSD).

6-2. STARTING TEST MODE

Press the [TITLE], [CLEAR], [POWER] keys on the remote commander in this order with the power of main unit in OFF status, and the Test Mode starts, then "DIAG START" will be displayed on the fluorescent display tube and the menu shown below will be displayed on the TV screen. At the bottom of menu screen, the model name and revision number are displayed. Last Off at the lower right of screen indicates the information code concerning the last power off. To execute each function, select the desired menu and press its number on the remote commander. To exit from the Test Mode, press the [POWER] key.

```
          Test Mode Menu

0. Syscon Diagnosis
1. Drive Auto Adjustment
2. Drive Manual Operation
3. Mecha Aging
4. Emargency Hisory
5. Version Information
6. Video Level Adjustment
                  Exit: Power Key
_
Model    : DPX-6xxxx
Revision : x.xxx    Last Off: xx
```

Power Off Information Code List

00: Primary Power Off
01: Power Off Request from SYSTEM CONTROL
02: Power Off by Emergency Power Off Command from SYSTEM CONTROL
(if information is sent from SYSTEM CONTROL)
03: IF CON Judged that SYSTEM CONTROL is Faulty
04: Power Off from Diagnosis Mode of IF CON
05: Forced Power Off by the User
06: Power Off by Power Supply Voltage Monitor

6-3. SYSCON DIAGNOSIS

The same contents as board detail check by serial interface can be checked from the remote commander. On the Test Mode Menu screen, press [0] key on the remote commander, and the following check menu will be displayed.

```
     ### Syscon Diagnosis ###
                  Check Menu
0. Quit
1. All
2. Version
3. Peripheral
4. Servo
5. Supply
6. AV Decoder
7. Video
8. Audio
_
```

0. (Quit)

Quit the Syscon Diagnosis and return to the Test Mode Menu.

1. (All items continuous check)

This menu checks all diagnostic items continuously. Normally, all items are checked successively one after another automatically unless an error is found, but at a certain item that requires judgment through a visual check to the result, the following screen is displayed for the key entry.

```
     ### Syscon Diagnosis ###

          Diag All Check
          No. 2 Version

 2-3. ROM Check Sum
Check Sum = 2005



Press NEXT Key to Continue
Press PREV key to Repeat
_
```

For the ROM Check, the check sum calculated by the Syscon is output, and therefore you must compare it with the specified value for confirmation.
Following the message, press [▶▶I] key to go to the next item, or [I◀◀] key to repeat the same check again.

To quit the diagnosis and return to the Check Menu screen, press [■] or [ENTER] key. If an error occurred, the diagnosis is suspended and the error code is displayed as shown below.

```
    ### Syscon Diagnosis ###


 3-2. EEPROM Check
Error 03: EEPROM  Write/Read N
Address       : 00000001
Write Data    : 2492
Read   Data   : 2490
Press NEXT Key to Continue
Press PREV key to Repeat
_
```

Press [■] key to quit the diagnosis, or [|◀◀] key to repeat the same item where an error occurred, or [▶▶|] key to continue the check from the item next to faulty item.

Selecting [2] and subsequent items call the submenu screen of each item. When "———" is displayed in the submenu, it means that the test is not supported in the model.

For example, if "5. Supply" is selected, the following submenu will be displayed.

```
    ### Syscon Diagnosis ###
          Check Menu
         No. 5 Supply
0. Quit
1. All
2. ARP Register Check
3. ARP to RAM Data Bus
4. ARP to RAM Address Bus
5. ARP RAM Check
_
```

0. (Quit)

Quit the submenu and return to the main menu.

1. (All submenu items continuous check.)

This menu checks 2 and subsequent items successively. At the item where visual check is required for judgment or an error occurred, the checking is suspended and the message is output for key entry. Normally, all items are checked successively one after another automatically unless an error is found.
Selecting [2] and subsequent items executes respective menus and outputs the results.
For the contents of each submenu, see "General Description of Checking Method" and "Check Items List".

General Description of Checking Method

2. Version

(2-2) Revision
ROM revision number is displayed.
Error: Not detected.
The revision number defined in the source file is displayed with four digits.

(2-3) ROM Check Sum
Check sum is calculated.
Error: Not detected.
8-bit data are added up to the ROM address 0x000F0000 to 0x002EFFFF, and the result is displayed with 4-digit hexadecimal number. Error is not detected. Compare the result with the specified value.

(2-4) Model Type
Model code is displayed.
Error: Not detected.
The model code read from the EEPROM is displayed with 2-digit hexadecimal number.

(2-5) Region
Region code is displayed.
Error: Not detected.
The region code determined from the model code is displayed.

(2-6) M't Check
Mount resistance is checked.
Error 22: The region code does not accord.
Check whether the region code that is deduced from model resistance and destination resistance accords with the region code that is deduced from region resistance value.

3. Peripheral

(3-2) EEPROM Check
Data write → read, and accord check
Error 03: EEPROM write/read discord
0x9249, 0x2942 and 0x4294 are written to the address 0x00 to 0xFF of the EEPROM and then read for checking. Before writing, the data are saved, then after checking, they are written to restore the contents of EEPROM.

(3-3) Gate Array Check (Machine only in which Gate Array is installed)
Data write → read, and accord check
Error 02: Gate array write/read discord
Data of 0x00 to 0xFF is written sequentially to the address 0xF and then read for checking.

(3-4) HAND FLASH Check (HAND Flash installed model only)
Data clear → write → read, and accord check
Error 04: Clear error
05: Write error
06: Read data discord
21: Number of defective block exceeds 10.
Clear 0th block of flash memory and write. Then read for checking.
When defective block exists, the address is displayed.
When the number of defective block exceeds 10, it is error.

(3-5) SACD Check (SACD Decoder installed model only)
Device reset → Built-in RAM check
Error 50: Write/read data discord

(3-6) Venc Check (Progressive support model only)
Data write → read, and accord check
Error: 52: Write/read data discord
Error may occur due to defect of access with syscon.

(3-7) ————— (Not supported)

(3-8) External RAM Check (External RAM installed model only)
Test data write → read, and accord check
Error
Check the external RAM used in syscon.

4. Servo

(4-2) Servo DSP Check
Data write → read, and accord check
Error 12: Read data discord
0x9249, 0x2942 and 0x4294 are written to the RAM address 0x602 of the Servo DSP and then read for checking.

(4-3) —————
Check no support.

(4-4) RF Amp Register Check
Data write → read, and accord check
Error xx: RF Amp register write, and read data discord
Implement 8-bit shift operation of the xx to the readable/writable register of the RF Amp. If once write data do not accord with read data, it is NG.

5. Data Supply System

(5-2) ARP Register Check
Data write → read, and accord check
Error 08: ARP register write, and read data discord
Data 0x00 to 0xFF is written sequentially to the ARP TMAX register (address 0xC6) and then read for checking.

(5-3) ARP to RAM Data Bus
Data write → read, and accord check
Error 09: ARP ←→ RAM data bus error
Data 0x0001 to 0x8000 where one bit each is set to 1 are written to the address 0 of RAM (IC303) connected to the ARP (IC302) through the bus, then they are read and checked. In case of discord, written bit pattern and read data are displayed. If data where multiple bits are 1 are read, the bits concerned may touch each other. Further, if data where certain bit is always 1 or 0 regardless of written data, the line could be disconnected or shorted.

(5-4) ARP to RAM Address Bus
Data write → other address read discord check
Error 10: ARP ←→ RAM address bus error
Caution: Address and data display in case of an error is different from the display of other diagnosis (described later).
Before starting the test, all addresses of RAM (IC303) are cleared to 0x0000.
First, 0xA55A is written to the address 0x00000, and the address data are read and checked from addresses 0x00001 to 0x80000 while shifting 1 bit each. Next, the data at that address is cleared, and it is written to the address 0x00001, and read and checked in the same manner. This check is repeated up to the address 0x80000 while shifting the address data by 1 bit each.
If data other than 0 is read at the addresses except written address, an error is given because all addresses were already cleared to 0. In this check, the error display pattern is different from that of other diagnosis; read data, written address, and read address are displayed in this order. However, the message uses same template, and accordingly exchange Address and Data when reading. The following display, for example,

```
    ### Syscon Diagnosis ###




 5-4.ARP to RAM Address Bus
Error 10: ARP - RAM Address B
Address       : 0000A55A
Write Data    : 00000000
Read Data     : 00080000
Press NEXT Key to Continue
Press PREV key to Repeat
_
```

shows the data 0xA55A was read from address 0x00080000 though it was written to the address 0x00000000. This implies that these addresses are in the form of shadow. Also, if the read data is not 0xA55A, another error will be present.

(5-5) ARP RAM Check
Data write → read, and accord check
Error 11: ARP RAM read data discord
The program code data stored in ROM are copied to all areas of RAM (IC303) connected to the ARP through the bus, then they are read and checked if they accord. If the detail check was selected initially, the data are written to all areas and read, then the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 11, and the test is suspended.

6. AV Decoder

(6-2) 1935 RAM
Data write → read, and accord check
Error 13: AVD RAM read data discord
The program code data stored in ROM (IC107) are copied to all areas of RAM (IC504, IC505) connected to the AVD through the bus, then they are read and checked if they accord. Further, the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 13, and the test is suspended.
During the test, OSD display becomes blank as the OSD area is also checked.

(6-3) 1935 SP
ROM → AVD RAM → Video OUT
Error: Not detected.
The data including sub picture streams in ROM are transferred to the RAM in AVD, and output as video signals from the AVD.
Though OSD display becomes blank, the output of video signals continues until the key is pressed.

7. Video Output

(7-2) Color Bar
AVD color bar command write → Video OUT
Error: Not detected.
The command is transferred to the AVD, and the color bar signals are output from video terminals.

(7-3) Composite Out (European model only)
EURO-AV video output check
AVD color bar command write → Video (EURO-AV) OUT
Error: Not detected.
With the component of video output turned off, the color bar signals are output from the EURO-AV terminal.
This check is performed for European model only.

(7-4) Y/C Out (European model only)
Y/C video output check
AVD color bar command write → Video (Y/C) OUT
Error: Not detected.
With the Y/C of video output turned on, the color bar signals are output.
This check is performed for European model only.

(7-5) RGB Out (European model only)
RGB video output check
AVD color bar command write → Video (RGB) OUT
Error: Not detected.
With the RGB of video output turned on, the color bar signals are output.
This check is performed for European model only.

(7-6) Component Out (European model only)
Component video output check
AVD color bar command write → Video (Component) OUT
Error: Not detected.
With the component of video output turned on, the color bar signals are output.
This check is performed for European model only.

(7-7) Euro AV Through (European model only)
AV Through output On/Off
Error: Not detected.
AV Through output is turned on.
This check is performed for European model only.

8. Audio Output

(8-2) ARP →1935
Data flow from supply system DRAM to SDRAM of AV Decoder is tested.
Error 14: ARP → 1935 video NG
15: ARP → 1935 audio NG

(8-3) Test Tone
Pink noise output
Error: Not detected.
In the models without DD output, the test tone is output from L and R of 2-channel only, and in the models with DD output, the test tone is output from L and R of 2-channel, and all channels of 5.1 output.
After turning on all outputs, each time the NEXT key is pressed, the output channel is switched for individual channel checking.

Diagnosis Check Items List

2. Version Display
(2-2) Revision
(2-3) ROM Check Sum
(2-4) Model Type
(2-5) Region
(2-6) M't Check

3. Peripheral
(3-2) EEPROM Check
(3-3) Gate Array Check
(3-4) NAND FLASH Check (NAND Flash installed model only)
(3-5) SACD Check (SACD decoder installed model only)
(3-6) Venc Check (Video encoder installed model only)
(3-7) ———— (Function not supported)
(3-8) External RAM Check (External RAM installed model only)

4. Servo
(4-2) Servo DSP Check
(4-3) ———— (Function not supported)
(4-4) RF Amp Register Check

5. Data Supply System
(5-2) ARP Register Check
(5-3) ARP to RAM Data Bus
(5-4) ARP to RAM Address Bus
(5-5) ARP RAM Check

6. AV Decoder
(6-2) 1935 RAM
(6-3) 1935 SP

7. Video Output
(7-2) Color Bar
(7-3) Composite Out (European model only)
(7-4) Y/C Out (European model only)
(7-5) RGB Out (European model only)
(7-6) Component Out (European model only)
(7-7) Euro AV Through (European model only)

8. Audio Output
(8-2) ARP →1935
(8-3) Test Tone

Error Codes List

00: Error not detected
01: RAM write/read data discord
02: Gate array NG
03: EEPROM NG
04: Flash memory clear error
05: Flash memory write error
06: Flash memory read data discord
07: 2725 read data discord
08: ARP register read data discord
09: ARP ←→ RAM data bus error
10: ARP ←→ RAM address bus error
11: ARP RAM read data discord
12: Servo DSP NG
13: RF Amp NG
14: 1935 SDRAM NG
15: ARP →1935 video NG
16: ARP →1935 audio NG
19: 1910 UCODE download NG
1A: System call error (Function not supported)
1B: System call error (Parameter error)
1C: System call error (Illegal ID number)
20: System call error (Time out)
21: NAND Flash faulty blocks exceed 10
22: Resistor installation error
50: SACD Decoder W/R NG
52: Video Encoder W/R NG
55: External RAM W/R NG
90: Error occurred
91: User verification NG
92: Diagnosis cancelled

6-4. DRIVE AUTO ADJUSTMENT

On the Test Mode Menu screen, press [1] key on the remote commander, and the drive auto adjustment menu will be displayed.

```
   ## Drive Auto Adjustment ##

         Adjustment Menu

0. ALL
1. DVD-SL
2. CD
3. DVD-DL
4. LCD


                     Exit: RETURN
```

Normally, [0] is selected to adjust DVD (single layer), CD, and DVD (dual layer) in this order. But, individual items can be adjusted for the case where adjustment is suspended due to an error. In this mode, the adjustment can be made easily through the operation following the message displayed on the screen. Which disc is currently adjusted is displayed on the fluorescent display tube.

0. ALL

You will be asked if EEPROM data are initialized or not, and for this prompt, select [0] and press the [ENTER] key. First, the servo setting data in EEPROM, Emergency History and Hour Meter are cleared to initialize. Then, [1] DVD-SL disc, [2] CD disc, and [3] DVD-DL disc are adjusted in this order. Each time one disc was adjusted, it is ejected, and therefore exchange the disc following the message. You can exit the adjustment by pressing the [■] button. In adjusting each disc, the mirror time is measured to check the disk type. In the auto adjustment, whether the disc type is correct is not checked unlike conventional models, and accordingly, take care not to insert a different type of disc.

1. DVD Single Layer Disc

Select [1], insert DVD single layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM. The table No. 1 is used in the changer type model. If there is no disc on the table No. 1, the tray will be open to wait for closing. If there is a disc on the table, the adjustment starts immediately. If you put a disc prior to adjustment, confirm that the SL disc is set on the table 1.

DVD Single Layer Disc Adjustment Steps

1. SLED Reset
2. Disc Check Memory SL
3. Set Disc Type SL
4. Spdl Start
5. Ld ON
6. Focus Error Check
7. Focus ON 0 with PI Level measure
8. Auto Track Offset Adjust L0
9. Trv Level Check
10. Tracking ON
11. CLVA ON
12. Sled ON
13. Auto Focus Balance Adjust
14. Auto Loop Filter Offset Adjust
15. Auto Focus Gain Adjust L0
16. Auto Focus Balance Adjust L0
17. EQ Boost Adjust
18. Auto Loop Filter Offset Adjust
19. Auto Tracking Gain Adjust
20. RF Level Measure
21. Jitter measure
22. Eep Copy Loop Filter Offset
23. All Servo Stop

2. CD Disc

Select [2], insert CD disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM. The table No. 2 is used in the changer type model. If there is no disc on the table No. 2, the tray will be open to wait for closing. If there is a disc on the table, the adjustment starts immediately. If you put a disc prior to adjustment, confirm that the CD is set on the table 2.

CD Adjustment Steps

1. Sled Reset
2. Disc Check Memory CD
3. Set Disc Type CD
4. Spdl Start
5. LD ON
6. Focus Error Check
7. Fcs ON 1 with PI Level measure
8. Auto Track Offset Adjust L0
9. Trv Level Check
10. Tracking ON
11. CLVA ON
12. Sled ON
13. Auto Focus Balance Adjust
14. Auto Loop Filter Offset Adjust
15. Auto Focus Gain Adjust L0
16. Auto Focus Balance Adjust L0
17. Eq Boost Adjust
18. Auto Loop Filter Offset Adjust
19. Auto Track Gain Adjust
20. Copy Adjustment Data to LCD
21. RF Level Measure
22. Jitter measure
23. All Servo Stop

3. DVD Dual Layer Disc

Select [3], insert DVD dual layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM. The table No. 3 is used in the changer type model. If there is no disc on the table No. 3, the tray will be open to wait for closing. If there is a disc on the table, the adjustment starts immediately. If you put a disc prior to adjustment, confirm that the DL disc is set on the table 3.

DVD Dual Layer Disc Adjustment Steps

1. Sled Reset
2. Disc Check Memory DL
3. Set Disc Type DL
   DVD DL Layer 1 Adjust
4. Spdl Start
5. LD ON
6. Fcs ON 1 with PI Level measure
7. Auto Track Offset Adjust L1
8. Tracking ON
9. Clva ON
10. Sled ON
11. Auto Focus Balance Adjust
12. Auto Focus Gain Adjust L1
13. Auto Focus Balance Adjust L1
14. Eq Boost Adjust L1
15. Auto Track Gain Adjust L1
16. Jitter measure
    DVD DL Layer 0 Adjust
17. Focus Jump (L1 → L0)
18. Auto Track Offset Adjust L0
19. Tracking ON
20. Clva ON
21. Sled ON
22. Auto Focus Balance Adjust
23. Auto Focus Gain Adjust L0
24. Auto Focus Balance Adjust
25. Eq Boost Adjust L0
26. Auto Track Gain Adjust L0
27. Jitter measure
28. All Servo Stop

4. LCD

LCD disc is not adjusted because the adjusted data of CD are reflected, and SACD (hybrid disc) is not adjusted because the adjusted data of CD and DVD-DL are reflected.

6-5. DRIVE MANUAL OPERATION

On the Test Mode Menu screen, select [2], and the manual operation menu will be displayed. For the manual operation, each servo on/off control and adjustment can be executed manually.

```
   ## Drive Manual Operation ##

          Operation Menu
1. Disc Type
2. Servo Control
3. Track/Layer Jump
4. Manual Adjustment
5. Auto Adjustment
6. Memory Check

0. Disc Check Memory

                     Exit: RETURN
```

In using the Manual Operation menu, take care of the following points. These commands do not provide protection, thus requiring correct operation. The sector address or time code field is displayed when a disc is loaded.

1. Set correctly the disc type to be used on the Disc Type setting screen.
   The Disc Type setting must be performed after a disc was loaded.
   The set Disc Type is cleared when the tray is opened.
2. After power ON, if the Manual Operation was selected, first perform "Reset SLED TILT" by opening 1. Disc Type screen.
3. In case of an alarm, immediately press the [■] button to stop the servo operation, and turn the power OFF.

Basic operation (controllable from front panel or remote commander)

[POWER] : Power OFF
[■] : Servo stop
[⏏] (Open/Close) : Stop+Eject/Loading
[↶] : Return to Operation Menu or Test Mode Menu
[▶▶|], [|◀◀] : Transition between sub modes of menu
[1] to [9], [0] : Selection of menu and items
Cursor [↑]/[↓] : Increase/Decrease in manually adjusted value

0. Disc Check Memory

```
            Disc Check


1. SL Disc Check
2. CD Disc Check
3. DL Disc Check




0. Reset SLED TILT
```

On this screen, the mirror time is measured and written to the EEPROM to check the disc type. First, set a DVD SL disc and press [1], then set a CD disc and press [2], and finally set a DVD DL disc and press [3]. The measured mirror time is displayed respectively.
The adjustment must be executed more than once after default data were written.
From this screen, you can go to another mode by pressing [▶▶|] or [|◀◀] key, but you cannot enter this mode from another mode. You can enter this mode from the Operation Menu screen only.

1. Disc Type

```
            Disc Type
1. Disc Type Auto Check
2. DVD SL     12cm
3. DVD DL     12cm
4. CD         12cm
5. SACD       12cm
6. DVD SL     8cm
7. DVD DL     8cm
8. CD         8cm
9. LCD        8cm
0. Reset SLED TILT
                        EMG. 00
```

On this screen, select the disc type. To select the disc type, press the number of the loaded disc. The selected disc type is displayed at the bottom. Selecting [1] automatically selects and displays the disc type. In case of wrong display, retry "Disc Check Memory". Also, opening the tray causes the set disc type to be cleared. In this case, set the disc type again after loading.
In performing manual operation, the disc type must be set.

Once the disc type has been selected, the sector address or time code display field will appear as shown below. These values are displayed when PLL is locked.

```
            Disc Type
1. Disc Type Auto Check
2. DVD SL     12cm
3. DVD DL     12cm
4. CD         12cm
5. SACD       12cm
6. DVD SL     8cm
7. DVD DL     8cm
8. CD         8cm
9. LCD        8cm
0. Reset SLED TILT
           SA.———— SI.— EMG.00
DVD SL 12cm
```

Display when DVD SL 12cm disc was selected

```
            Disc Type
1. Disc Type Auto Check
2. DVD SL     12cm
3. DVD DL     12cm
4. CD         12cm
5. SACD       12cm
6. DVD SL     8cm
7. DVD DL     8cm
8. CD         8cm
9. LCD        8cm
0. Reset SLED TILT
              TC. —:—:— EMG.00
CD     12cm
```

Display when CD 12cm disc was selected

[0] Reset SLED TILT:	Reset the Sled and Tilt to initial position. (Reset the Sled only to initial position because the Tilt mechanism is not available in this model.)
[1] Disc Type Check:	Judge automatically the loaded disc. As the judged result is displayed at the bottom of screen, make sure that it is correct. If Disc Check Memory menu has not been executed after EEPROM default setting, the disc type cannot be judged. In this case, return to the initial menu and make a check for three types of discs (SL, DL, CD).
[2] to [9]:	Select the loaded disc. The adjusted value is written to the address of selected disc. No further entry is necessary if [1] was selected.

2. Servo Control

```
          Servo Control
1. LD          Off   R. Sled FWD
2. SP          Off   L. Sled REV
3. Focus       Off
4. TRK.        Off
5. Sled        Off
6. CLVA        Off
7. FCS. Srch   Off


0. Reset SLED TILT
          SA.———— SI.— EMG.00
DVD SL 12cm
```

On this screen, the servo on/off control necessary for replay is executed. Normally, turn on each servo from 1 sequentially and when CLVA is turned on, the usual trace mode becomes active. In the trace mode, DVD sector address or CD time code is displayed. This is not displayed where the spindle is not locked.
The spindle could run overriding the control if the spindle system is faulty or RF is not present. In such a case, do not operate CLVA.

[0] Reset SLED TILT:	Reset the Sled and Tilt to initial position. (Reset the Sled only to initial position because the Tilt mechanism is not available in this model.)
[1] LD:	Turn ON/OFF the laser.
[2] SP:	Turn ON/OFF the spindle.
[3] Focus:	Search the focus and turn on the focus.
[4] TRK.:	Turn ON/OFF the tracking servo.
[5] Sled:	Turn ON/OFF the sled servo. When PLL is not locked (cannot be locked), the sled servo is not turned ON. The display keeps ON.)
[6] CLVA:	Turn ON/OFF normal servo of spindle servo.
[7] FCS. Srch:	Apply same voltage as that of focus search to the focus drive to check the focus drive system.
[→] Sled FWD:	Move the sled outward. Perform this operation with the tracking servo turned off.
[←] Sled REV:	Move the sled inward. Perform this operation with the tracking servo turned off.

3. Track/Layer Jump

```
        Track/Layer Jump
1. 1Tj FWD    R. Fj (L1->L0)
2. 1Tj REV    L. Fj (L0->L1)
3. 2Tj FWD    U. Lj (L1->L0)
4. 2Tj REV    D. Lj (L0->L1)
5. NTj FWD
6. NTj REV
7. 500Tj FWD
8. 500Tj REV
9. 10k/20k FWD
0. 10k/20k REV
           SA.―――――SI.――EMG.00
DVD DL 12cm
```

On this screen, track jump, etc. can be performed. Only for the DVD-DL, the focus jump and layer jump are displayed in the right field.

[1] 1Tj FWD: 1-track jump forward.
[2] 1Tj REV: 1-track jump reverse.
[3] 2Tj FWD: 2-track jump forward.
[4] 2Tj REV: 2-track jump reverse.
[5] NTj FWD: N-track jump forward.
[6] NTj REV: N-track jump reverse.
[7] 500Tj FWD: Fine search forward.
[8] 500Tj REV: Fine search reverse.
[9] 10k/20k FWD: Direct search forward.
[0] 10k/20k REV: Direct search reverse.

– The following commands are valid for DVD-DL disc only –
[→] (L1 → L0): Focus jump (Trk/Sled Servo OFF) forward.
[←] (L0 → L1): Focus jump (Trk/Sled Servo OFF) reverse.
[↑] (L1 → L0): Layer jump (Trk/Sled Servo ON) forward.
[↓] (L0 → L1): Layer jump (Trk/Sled Servo ON) reverse.

4. Manual Adjustment

```
   Manual Adjustment:Up/Down
1. TRK. Offset
2. Focus Gain
3. TRK. Gain
4. Focus Offset
5. Focus Balance
6. L.F. Offset
7. Analog FRSW
8. PLL Dac Gain
9. EQ BOOST
0. GD ADJ
Adjustment: Up/Down
       SA. ------ SI. -- EMG. 00
DVD SL 12cm            Jitter FF
```

On this screen, each item can be adjusted manually. Select the desired number [1] to [0] from the remote commander, and current setting for the selected item will be displayed, then increase or decrease numeric value with [↑] key or [↓] key. This value is stored in the EEPROM. If CLV has been applied, the jitter is displayed for reference for the adjustment.

[1] TRK. Offset: Adjusts tracking offset.
[2] Focus Gain: Adjusts focus gain.
[3] TRK. Gain: Adjusts track gain.
[4] Focus Offset: Adjusts focus offset.
[5] Focus Balance: Adjusts focus balance.
[6] L.F. Offset: Adjusts loop filter offset.
[7] Analog FRSW: Sets select switch of analog feedback circuit.
[8] PLL Dac Gain: Adjusts D/A converter gain of PLL.
[9] EQ BOOST: Adjusts boost amount of equalizer.
[0] GD ADJ: Adjusts group delay amount.

5. Auto Adjustment

```
         Auto Adjustment
1. Auto TRK. Offset
2. Auto Focus Balance
3. Auto Focus Offset
4. Auto Focus Gain
5. Auto TRK. Gain
6. Auto EQ.
7. Auto L.F. Offset
8. Auto Group Delay

          SA.04EF905 SI.00 EMG.00
DVD SL 12cm
```

On this screen, each item can be adjusted automatically. Select the desired number [1] to [8] from the remote commander, and selected item is adjusted automatically.

[1] Auto TRK. Offset: Adjusts tracking offset.
[2] Auto Focus Balance: Adjusts focus balance.
[3] Auto Focus Offset: Adjusts focus offset.
[4] Auto Focus Gain: Adjusts focus gain.
[5] Auto TRK. Gain: Adjusts track gain.
[6] Auto EQ
[7] Auto L.F. Offset: Adjusts loop filter offset.
[8] Auto Group Delay

6. Memory Check

The display image is shown below and three screens in total can be selected.

```
EEPROM DATA 1        — DL —
             CD  LCD SL  L0  L1
Focus Gain   xx  xx  xx  xx  xx
TRK. Gain    xx  xx  xx  xx  xx
FCS Balnce   xx  xx  xx  xx  xx
Focus Bias   xx  xx  xx  xx  xx
TRV Offset   xx  xx  xx  xx  xx
L.F. Offset  xx  xx  xx  xx  xx
EQ. Boost    xx  xx  xx  xx  xx
_
UP    : Last Data
DOWN  : Next Data
CLEAR : Default Set      page.1/3
```

```
EEPROM DATA 2        — DL —
             CD  LCD SL  L0  L1
RF Jitter    xx  --  xx  xx  xx
RF Level     xx  --  xx  --  --
FE Level     xx  --  xx  --  --
FE Balance   xx  --  xx  --  --
TRV.Level    xx  --  xx  --  --
TE Gain      xx  xx  --  --  --
PI Level     xx  --  xx  xx  --
_
UP    : PREV Data
DOWN  : Next Data
CLEAR : Default Set      page.2/3
```

```
EEPROM DATA 3        — DL —
             CD  LCD SL    L0  L1
Analog FRSW  xx  xx  xx    xx  xx
PLL Dac Gain xx  xx  xx    xx  xx
Mirror Time  xx  xx  xx    xx  xx

_  THR A&L   xx  xx  xx/xx xx  xx
UP    : PREV Data
DOWN  : First Data
CLEAR : Default Set      page.3/3
```

On this screen, current servo adjusted data stored in the EEPROM are displayed. The adjusted data are initialized by pressing the [CLEAR] key, but be careful that they are not recoverable after initialization.
Before clearing the adjusted data, make a note of the set data. This screen will also appear if [0] All is selected in the Drive Auto Adjustment. In this case, default setting cannot be made.
"THR A&L" data on the second page cannot be changed if default setting is once made.

6-6. MECHA AGING

```
        ### Mecha Aging ###



Press OPEN key




Abort : STOP key
```

On the Test Mode Menu screen, selecting [3] executes the aging of mechanism. First, open the tray and load a disc. Press the [▷] key, and the aging will start. When the tray is closed, the disc type and size are judged and displayed. During aging, the number of the repeat cycle is displayed. Aging can be aborted at any time by pressing the [■] key. After the operation has stopped, unload the disc and press again the [■] key or the [↶] key to return to the Test Mode Menu.

6-7. EMERGENCY HISTORY

```
       ### EMG. History ###

Laser Hours   CD   xxhxxm
              DVD  xxhxxm

 1.  00 00 00 00   00 00 00 00
     00 00 00 00   00 00 00 00

 2.  00 00 00 00   00 00 00 00
     00 00 00 00   00 00 00 00

Select : 1-9      Scroll :UP/DOWN
(1: Last EMG.)    Exit   :RETURN
```

On the Test Mode Menu screen, selecting [4] displays the information such as servo emergency history. The history information from last "1" up to "10" can be scrolled with [↑] key or [↓] key. Also, specific information can be displayed by directly entering that number with the ten-key pad from [1] to [9].
(Emergency history code is shown separately.)
The upper two lines display the laser ON total hours. Data below minutes are omitted.

Clearing History Information

◎ Clearing laser hours
Press [DISPLAY] and [CLEAR] keys in this order.
Both CD and DVD data are cleared.

◎ Clearing emergency history
Press [TITLE] and [CLEAR] keys in this order.

◎ Initializing setup data
Press [DVD menu] and [CLEAR] keys in this order.
The data have been initialized when "Set Up Initialized" message is displayed.
The EMG. History display screen will be restored soon.

6-8. VERSION INFORMATION

```
   ### Version Infomation ###

IF con.       Ver.x.xxx(xxxx)
              Group   xx

SYScon.       Ver.x.xxx(xxxx)
              Model   xx
              Region  0x

 Servo DSP Ver:x.xxx
 AVD ucode Ver:xxxxxxxx
 OPT TYPE : x LASER
Exit : RETURN
```

The ROM version, region code, OPT type, etc. are displayed if [5] is selected in the Test Mode Menu. The parenthesized hexadecimal number in the version number field indicates the checksum value of the ROM.

∗ Note after Downloading
After downloading ROM data, sometimes it happens that checksum is not the same as that of ROM data that has been downloaded.
In such a case, go back to the menu screen and select "0. Syscon Diagnosis", then select "1. All" in "2. Version". If the result of this operation does not give an agreement, it must be either Download error or ROM error.

6-9. VIDEO LEVEL ADJUSTMENT

On the Test Mode Menu screen, selecting [6] displays color bars for video level adjustment. During display of color bars, OSD disappears but the menu screen will be restored if pressing any key.

6-10. IF CON SELF DIAGNOSTIC FUNCTION

1. IF-89 BOARD (IF CON) TEST MODE

The IF-89 board (IF CON) test mode is the IF CON self-diagnosis mode. The IF CON can diagnose the functions of the IF-89 board that the IF CON controls. Normally, the IF CON makes a serial communication with the SYSTEM CONTROL and operates following the commands from the SYSTEM CONTROL, but in the Test mode, the IF CON operates independently from the SYSTEM CONTROL.

In the test mode, the following functions can be checked.

1. Button function
2. Remote commander receiving function
3. SYSTEM CONTROL-IF CON serial communication
4. Click shuttle function
5. Fluorescent display tube lighting check
   Grid check
   Anode check
6. LED control function

In the test mode, the main unit operates same as usual, except voltage monitoring, communication monitoring, display of fluorescent display tube, and LED control.

1. The routine that monitors +3.3 V (PCONT) of MB-103 board is not provided.
2. The monitoring timer for serial communication with the SYSTEM CONTROL is not provided. The main unit is not placed in the Standby mode, even if the communication with SYSTEM CONTROL is normal.
3. Display of fluorescent display tube.
   (Normally, display is made following the commands from SYSTEM CONTROL)
4. LED control.
   (Normally, control is made following the commands from SYSTEM CONTROL)

2. OPERATION OF SELF CHECK MODE

The Self Check mode is the function to conduct the basic test to the FL display and DVD panel section.

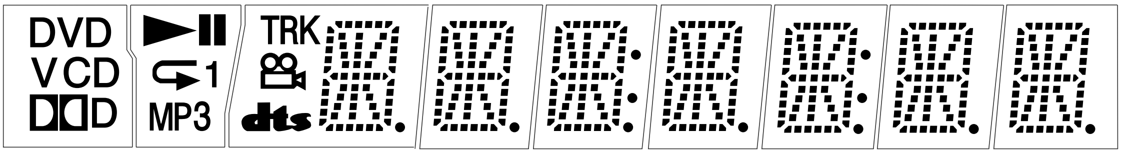
2-1. Self Check Mode Transition Processing

At the AC Power ON after reset of IF CON is released with the MB-103 board are not connected to the AV-61 board, or while pressing the [■] key on the main unit with the IF CON in STANDBY mode, enter [RETURN] → [DISPLAY] (or [SET UP]) on the remote commander, and the main unit transits to the Self Check Mode.

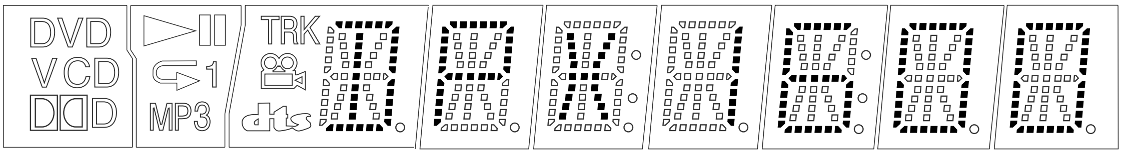
2-2. Operation of Auto Self Check

When the Self Check mode becomes active at the AC Power ON or by key input, the test display of the following steps (1) to (4) is repeated.

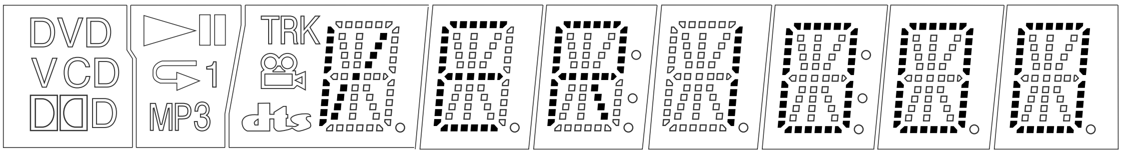
(1) FLD and LED all ON (for 5 seconds)



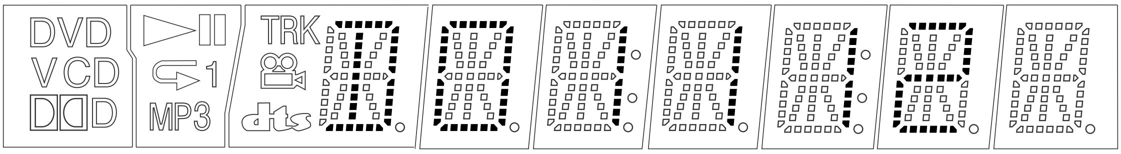
(2) MODEL display (for 2 seconds)



(3) Version display (for 2 seconds)



(4) ROM creation date display (for 2 seconds)



2-3. Each Self Check Function

Each Self Check function tests the FLD display, LED display, and key input.

Input Voltage [V]	IC404: Pin No. (Signal)			
	Pin ㉝ (BNRKEY)	Pin ㉞ (PLAY)	Pin ㉟ (O/C)	Pin ㊱ (TVS)
0 – 0.2	–	PLAY	OPEN/CLOSE	TVS
0.6 – 0.82	–	NEXT	–	PIC MODE
1.16 – 1.47	–	PREVIOUS	–	MODE
1.8 – 2.12	–	PAUSE	–	–
2.48 – 2.7	–	STOP	–	–

2-3-1. FLD and LED All ON

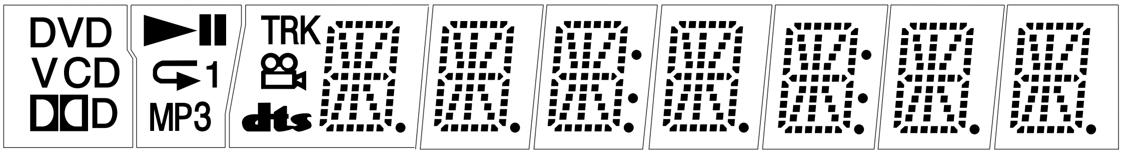
2-3-1-1. Transition Keys in Self Check Mode

- ■ key and ⏏ key on the main unit
- ← key on the main unit and the remote commander

2-3-1-2. Operation and Display

In this mode, all LEDs except STANDBY LED and all segments of FLD turn ON.

• Example of FLD all ON



2-3-2. Main Unit Key Name Display and Key Code Display

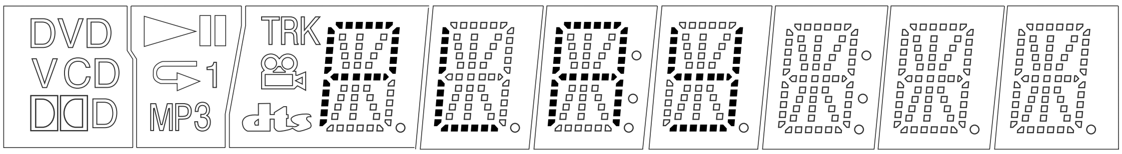
2-3-2-1. Transition Keys in Self Check Mode

- Keys on the main unit except keys transited in Self Check Mode

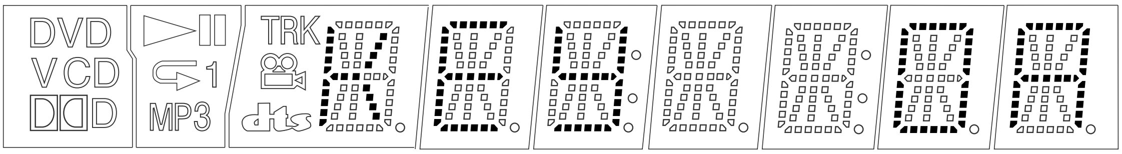
2-3-2-2. Operation and Display

When a key on the main unit is pressed in the Self Check mode, the name of that key is displayed on the FLD. Also, the key name display and the key code display can be switched with the DISPLAY key on the remote commander. “NOTHING” is displayed when nothing is entered. Also, VIDEO CD, DVD, and CD segments turn on when a communication error occurred.

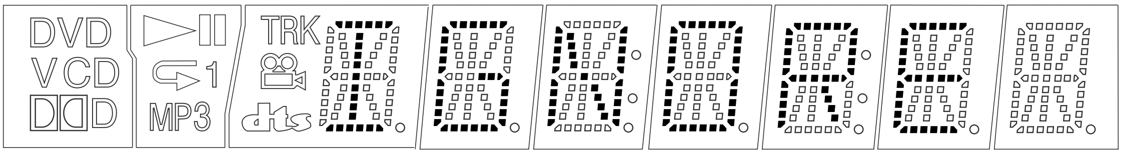
• FLD display (at input of ▷ key on the main unit)



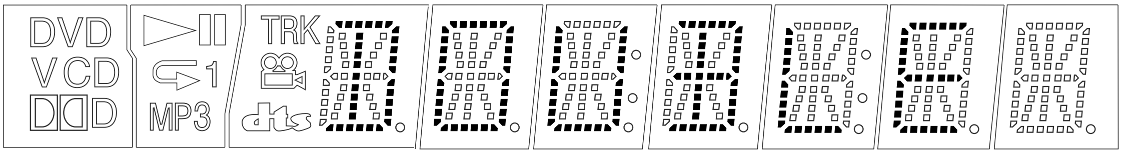
• **Key code display**
(at input of [▷] key, key code: 0 Ah)



• **At input of faulty voltage**



• **When key is pressed double**



2-3-3. Remote Commander Key Name Display and Key Code Display

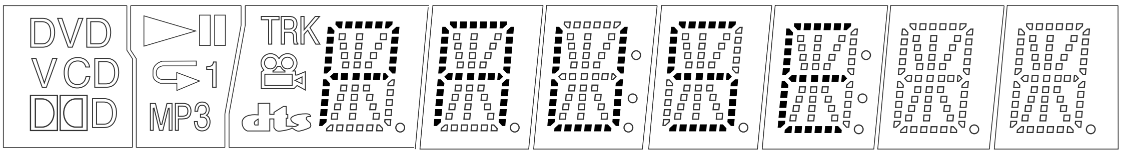
2-3-3-1. Transition Keys in Self Check Mode

• Remote commander keys except keys transited in Self Check Mode

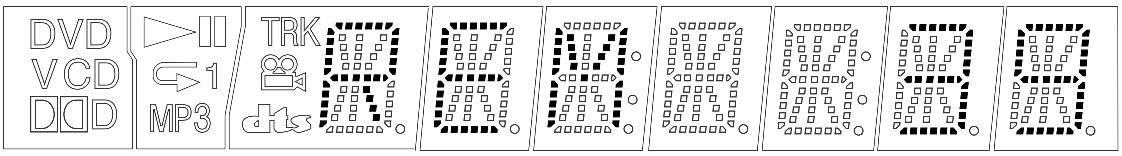
2-3-3-2. Operation and Display

When a key on the remote commander is pressed in the Self Check Mode, the name of that key is displayed on the FLD. Also, the key name display and the key code display can be switched with the [DISPLAY] key on the remote commander. “NOTHING” is displayed when nothing is entered. Also, VIDEO CD, DVD, and CD segments turn on when a communication error occurred.

• **Remote commander key name display (at input of [II] key)**



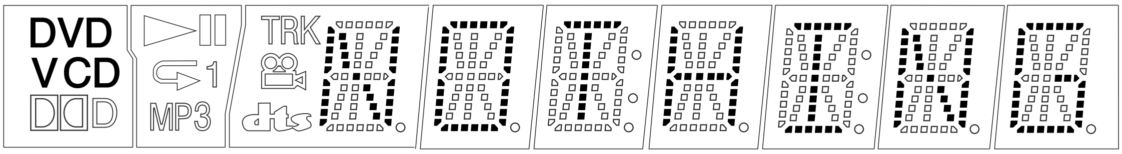
• **Remote commander key code display**
(at input of [II] key, key code: 39 h)



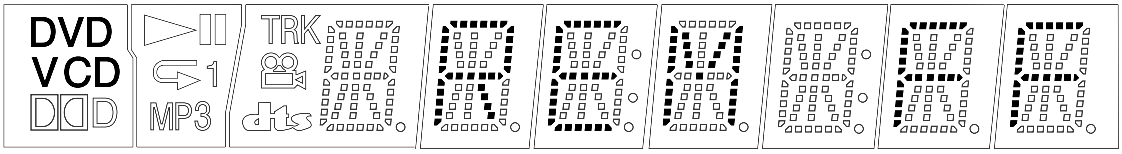
2-3-4. Communication Monitoring Display

The communication state is monitored and displayed while the key name on the main unit and the remote commander is displayed. When the communication to the System Controller failed, VIDEO CD, DVD, and CD segments turn on.

• Communication error display
(at no input of key and remote commander)



• Communication error display
(at code display without input of the remote commander)



2-3-5. FLD Anode Test Display and SHUTTLE Click Operation Test

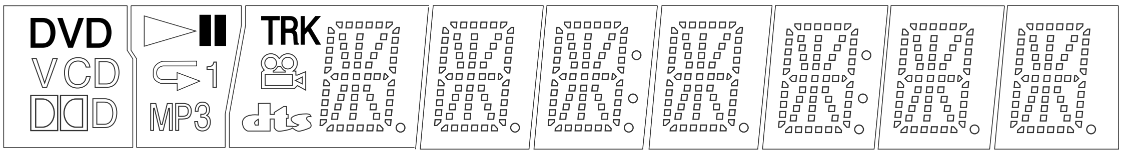
2-3-5-1. Transition Keys in Self Check Mode

- ⇥ key on the remote commander
- SHUTTLE on the remote commander during Anode Test display (This unit does not provide JOG/SHUTTLE, and therefore use another DVD remote commander having the JOG/SHUTTLE)

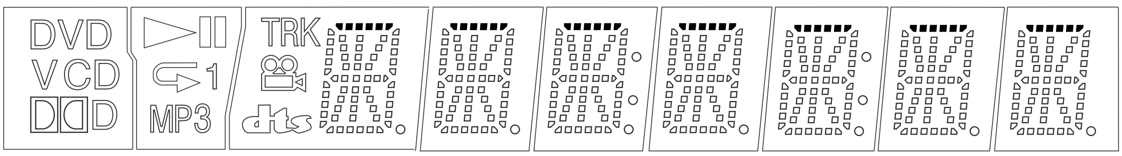
2-3-5-2. Operation and Display

The Self Check Mode transits to this mode when ⇥ key is entered. This tests whether each segment turns on individually. Only the first segment of each grid of FLD turns on, and each time the SHUTTLE is entered, the segment of each grid is switched in order. When SHUTTLE input is clockwise, the segment switches in 1 – 2 – 3 direction, or counterclockwise it switches in 3 – 2 – 1 direction.

• Display at the start of Anode Test



↓ (Input in CW direction)



2-3-6. FLD Grid Test Display and SHUTTLE Click Operation Test

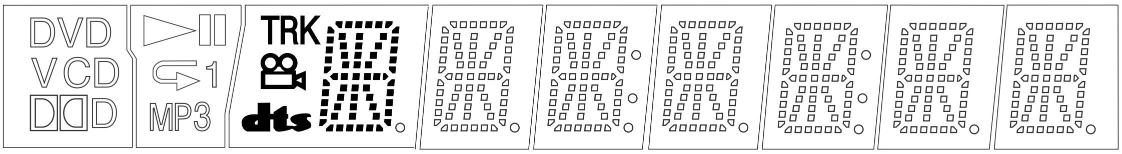
2-3-6-1. Transition Keys in Self Check Mode

- [↑] key on the remote commander
- SHUTTLE on the remote commander during Grid Test display
  (This unit does not provide JOG/SHUTTLE, and therefore use another DVD remote commander having the JOG/SHUTTLE)

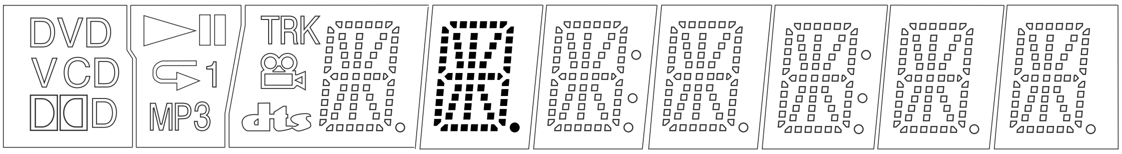
2-3-6-2. Operation and Display

The Self Check Mode transits to this mode when [↑] key is entered. This tests whether each grid turns on individually. The first grid only of FLD turns on and other grids turn off. Each time the SHUTTLE is entered, the grid is switched in order. When SHUTTLE input is clockwise, the grid switches in 1 – 2 – 3 direction, or counterclockwise it switches in 3 – 2 – 1 direction.

• Display at the start of Grid Test



↓ (Input in CW direction)



2-3-7. LED Test Display

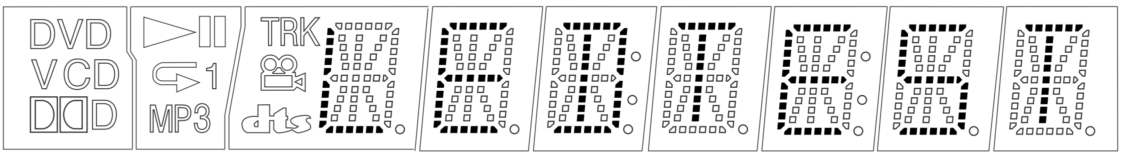
2-3-7-1. Transition Keys in Self Check Mode

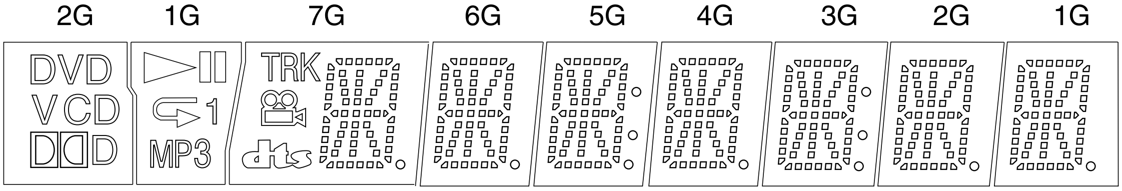
- [↓] key on the remote commander
- SHUTTLE on the remote commander during Grid Test display
  (This model does not provide JOG/SHUTTLE, and therefore use another DVD remote commander having the JOG/SHUTTLE)

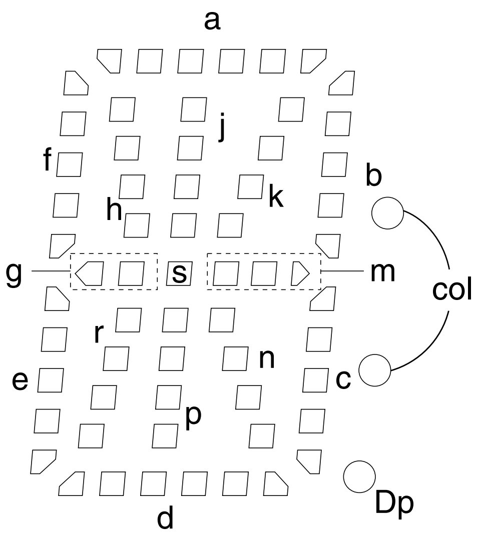
2-3-7-2. Operation and Display

LED is switched in order by the input of JOG/SHUTTLE on the remote commander. Also, LED ON/OFF is switched by the input of same key as the function that turns on the LED concerned.

• FLD display during LED Test







(7G-1G)

ANODE CONNECTION

	7G	6G	5G	4G	3G	2G	1G
P1	TRK		col		col	DVD	II
P2	a	a	a	a	a	a	a
P3	h	h	h	h	h	h	h
P4	j	j	j	j	j	j	j
P5	k	k	k	k	k	k	k
P6	b	b	b	b	b	b	b
P7	f	f	f	f	f	f	f
P8	m	m	m	m	m	m	m
P9	s	s	s	s	s	s	s
P10	g	g	g	g	g	g	g
P11	e	e	e	e	e	e	e
P12	n	n	n	n	n	n	n
P13	p	p	p	p	p	p	p
P14	r	r	r	r	r	r	r
P15	c	c	c	c	c	c	c
P16	d	d	d	d	d	d	d
P17	dts					DDD	MP3
P18						V	⇨
P19						CD	1
P20	Dp	Dp	Dp	Dp	Dp	Dp	▷

6-11. TROUBLESHOOTING

6-11-1. Cannot Enter Test Mode

You cannot enter the Test mode when either button has been pressed by any reason with the board assembled in the front panel. In this state, the power does not turn on even under normal condition (the unit is kept in standby state), and also no button is active and the remote commander is not accepted. In this case, disconnect the MB-103 board and AV-61 board, and with the SELF CHECK (pin ⑩) of IF CON (IC404) on the IF-89 board kept in low state, supply AC, and the IF CON self-diagnosis mode will be forcibly activated. The IF CON (IC404) checks the SELF CHECK port only after the power on reset (only at AC supply, not in standby state). If any button is pressed, its name is displayed on the fluorescent display tube. But, if other than "NOTHING" is displayed though no button is pressed, it means that any button has been pressed.

6-11-2. Faults in Test Mode (MB-103 board)

1. The test mode menu is not displayed.

1-1. Board visual check

Check that the ICs of SYSCON (IC104), ROM (IC106 or IC107), AVD (IC403), ARP & SERVO (IC301) are working correctly.
Check that outside appearance of the ICs is normal.
Check that IC pins are not short-circuited.
Check that there is no soldering error.
Check that outside appearance of the capacitors and resistors is normal.

1-2. Power supply voltage check

Check the power voltage of the power connector (CN102).
Check the power voltage of SYSCON (IC104).
Check the power voltage of ROM (IC106 or IC107).
Check the power voltage of AVD (IC403).
Check the power voltage of ARP & SERVO (IC301).
If the power voltage has any abnormality →
Check that the power supply lines are not shorted.
Check that there is no soldering error.
If any abnormality cannot be found still →
Check that each IC is working normally.

1-3. Clock signal check

Measure the clock signal frequency at CPUCK (CL101) of SYSCON (IC104) with an oscilloscope.
If the 8.25 MHz signal appears. → Check the machine according to section 1-3-1
If the 33 MHz signal appears. → Check the machine according to section 1-3-2.
If other frequencies are output.
R110 and R113 have defective soldering, X101 crystal oscillator is defective.
If the measurement point is fixed to either "H" or "L". →
Observe XFRRST (pin-(76)) of SYSCON (IC104) with an oscilloscope.
If the measurement point is "L", check the following items.
If the IC has defective soldering, if the IC is short-circuited.
If the measurement point is "H",
→ Component X101 or SYSCON (IC104) is defective.

1-3-1. When the 8.25 MHz signal appears at CPUCK

• Check the XRD, XWRH and CS0X signal.
Observe XRD (pin-(70)), XWRH (pin-(71)), and CS0X (pin-(58)) of SYSCON (IC104) with an oscilloscope.
If these pins are fixed to either "L" (0V) or "H" (3.3V), or if these pins stay in the center voltage, check the followings.
Check if the signal line does not have the defective soldering.
Check if the signal line is short-circuited with other signal lines.
If you cannot find any problem → SYSCON (IC104) is defective.

• HA [0 to 21] signal and HD [0 to 15] signal check
Observe HA [0 to 21] (pins-(102) to (109), (111) to (118), (120), ① to ⑤) of SYSCON (IC104) and HD [0 to 15] (pins-(85) to (100)) with an oscilloscope.
If these pins are fixed to either "L" (0V) or "H" (3.3V), or if the HA pin stays in the center voltage, check the followings. (HD stays in the center voltage when it is normal.)
→ Check if the signal line does not have the defective soldering, or is short-circuited with other signal line or SYSCON (IC104) is defective.

• Reset signal check
Check if XFRRST (pin-(76)) of SYSCON (IC104) normal or not.
The signal starts up at the same time as Vcc → Defective soldering.

If the trouble does not apply to any of the above-described phenomenon, SYSCON (IC104) or ROM (IC106 or IC107) is defective.

1-3-2. When the 33 MHz signal appears at CPUCK

• WAIT signal check

Observe XWAIT (pin-⑰) of SYSCON (IC104) with an oscilloscope.

If it is fixed to "L" (0V). → Observe CS2X to CS5X (pins-⑳ to ㉓).

If CS2X or CS3X is "L". → AVD (IC403) has defective soldering or AVD is defective.

If CS4x or CS5X is "L". → ARP & SERVO (IC301) has defective soldering or ARP & SERVO is defective.

If any one of the above is not "L". → XWAIT or CSnX is short-circuited or has the defective soldering or AVD (IC403) is defective or ARP & SERVO (IC301) is defective.

Center voltage → The XWAIT line has defective soldering or is short-circuited or AVD (IC403) is defective or ARP & SERVO (IC301) is defective or SYSCON (IC104) is defective.

• CSnX signal check

Observe CS0X to CS5X (pins-⑱ to ㉓) of SYSCON (IC104) with an oscilloscope.

If they are fixed to "L" (0V) or if to center voltage → Check that the ICs do not have the defective soldering or is short-circuited with the other signal lines or SYSCON (IC104) is defective.

CS0X: ROM (IC106 or IC107)
CS2X, CS3X: AVD (IC403)
CS4X, CS5X: ARP & SERVO (IC301)

If the trouble symptom does not apply to any of the above phenomenon, SYSCON (IC104) or ROM (IC106 or IC107) is defective.

2. Test mode menu is displayed but the machine stops when menu is selected

2-1. AVD (IC403) check

Observe SDCLKO (pin-127) of AVD (IC403) with an oscilloscope.

95 MHz → No problem

27 MHz → Observe the XRST, HA, HD, XRD, XWRH INT and CS signal waveform at the respective pins of AVDEC, AVD (IC403) is defective.

If the signal is other than the above frequencies → AVD (IC403) 27MHz signal line (CLKI (pin-158), SCLKIN (pin-160)) is short-circuited, IC mount is defective, AVD (IC403) is defective, PLL (IC103) is defective.

2-2. INT signal check

Observe INT0 to 2 (pins-⑯ to ⑱) of SYSCON (IC104) with an oscilloscope.

If they are fixed to "L" (0V) or fixed to the center voltage → Check that the ICs do not have the defective soldering, or are short-circuited, SYSCON (IC104) is defective, or the following ICs are not defective.

INT0: AVD (IC403)
INT1, INT2: ARP & SERVO (IC301)

2-3. If any abnormality cannot be confirmed by the above-described checks, check the CS signal that is currently output.

The CS signal other than CS0X is being output. → IC mount is defective or the IC is defective depending on the moving CS signal.

CS2X, CS3X: AVD (IC403)
CS4X, CS5X: ARP & SERVO (IC301)

If the trouble is not applicable to any of the above phenomenon, SYSCON (IC104) or ROM (IC106 or IC107) is defective.

3. If the message "SDSP No Ack" appears after the menu is displayed.

3-1. ARP & SERVO clock signal check

Check frequency of CLKIN (pin-150)

33 MHz → Normal

Frequency other than 33 MHz → CLKIN is short-circuited or defective soldering or PLL (IC103) is defective or ARP & SERVO (IC301) is defective

3-2. ARP & SERVO (IC301) PLL oscillation check

Observe PLCKO (pin-87) of ARP & SERVO (IC301) with an oscilloscope.

If the pin is fixed to either "L" (0V) or "H" (3.3V).

If XRST if fixed to "L". XRST has the defective soldering, In all other cases. ARP & SERVO (IC301) is defective

If it is oscillating.

HA [0 to 7] are HD [8 to 15] are short-circuited, check XSDSPIT and XSDSPCS or ARP & SERVO (IC301) is defective.

4. If trouble occurs at the specific item of the "Diag All Check".

IC mount of the NG item is defective or IC is defective.

5. Picture and sound are not output.

Check connection of CN601

Check for the defective connection of flat cable and check of damage of the flat cable.

6. Picture is output but sound is not output.

Check the audio data output (at pins-㉔, ㉘, and ㉙) of AVD (IC403)

The audio data is not output. → AVD (IC403) or audio DAC (IC601) mount is defective or power supply is defective or AVD (IC403) or audio DAC (IC601) is defective.

PLL (IC103) 512fs output check

If the frequency or waveform has abnormality. → The signal line has defective soldering or the signal line is short-circuited with other signal lines or PLL (IC103) is defective.

7. Sound is output but picture is not output.

Observe pins-55, 57, 59, 61, 63 and 65 of AVD (IC403) with an oscilloscope.

If the analog signal is not output. → The signal line has the defective soldering or is short-circuited or parts are defective or AVD (IC403) is defective.

6-11-3. Drive Auto Adjustment stops due to error.

The ARP & SERVO (IC301) analog circuit of MB-103 board is defective or RF-Amp (IC201) or M-Driver (IC202) peripheral circuit is defective or optical pickup block is defective or flat cable connection is defective

6-11-4. The product itself is defective.

• If MB103 does not have any problem,

The board other than MB-103 board is defective or connection is defective or optical pickup block is defective or mechanism deck is defective

1. The red LED does not light when the AC power is turned on.

Check the EVER –13V (pin-③), EVER+3.3V (pin-⑪), EVER+11V (pin-⑬) voltage of the power supply block CN201.

If voltage is abnormal. → The power supply block is defective.

2. The LED does not light in green even once when the POWER button is pressed. It remains lighting in red (in the STANDBY mode).

2-1. Check the EVER -13V (pin-③), EVER+3.3V (pin-⑪), EVER+11V (pin-⑬) voltage at CN201 of the power supply block/

If voltage is abnormal. → The power supply block is defective.

2-2. Check if the fuse on the IF board has blown of not.

If the fuse has blown → Replace the fuse.

2-3. Check the P-CONT (pin-②) at CN401 of the IF-89 board when the POWER button is pressed.

If it remains at "L",

→ The signal line has the defective soldering or it is short-circuited with other signal lines or capacitor or resistor is defective or IFCON is defective or connection between the power supply block and the IF-89 board is defective, or connector installation is defective, or the power supply block is defective.

2-4. Check if the button is kept depressed in the IFCON self mode.

If the button is kept depressed. → The front panel is defective, or IF-89 board is defective.

2-5. Check PONCHK (pin-㉚) of IFCON (IC404) on the IF-89 board.

If it is 0.5 V or more. → The power supply is defective, or IF-89 board is defective.

3. If the LED lights in green but returns to red (STANDBY mode) in several seconds when the POWER button is pressed.

3-1. Check CN201 voltage of the power supply block when the LED lights in green.

If voltage is abnormal. → The power supply block is defective, or the IF-89 board is defective, or MB103 is defective

3-2. Check XFRRST (pin-⑧) at CN101 on the MB-103 board.

If it is fixed to "L". → The signal line has defective soldering, or is short-circuited with other signal lines, or parts are defective.

3-3. Check IFBSY (pin-⑤), XIFCS (pin-⑥), SI0 (pin-④), SO0 (pin-①) and SC0 (pin-③) at CN101

If they are fixed to "H" or "L".

→ The signal line has defective soldering, or is short-circuited with other signal line, or parts are defective, or SYSCON (IC104) is defective

If they change between "L/H".

Connector installation is defective, or the IF-89 board is defective, or SYSCON (IC104) is defective.

If they stay in the center voltage.

Poor connection of flexible wiring board such as it is inserted in an angle diagonally, or defective soldering, or is short-circuited with other signal line.

3-4. Check PONCHK (pin-㉚) of IFCON (IC404) on the IF-89 board.

If rise-up time from 0.5 V to 1.5 V or more takes longer time, or it does not exceed 1.5 V or more. → The IF board is defective.

4. The LED lights in green but the fluorescent display tube does not light when the POWER button is pressed.

Connection between the power supply block and the IF-89 board is defective, or connector installation is defective, or the IF-89 board is defective.

5. Both picture and sound are not output.

Connection between the power supply block and the IF-89 board is defective, or connection between the IF-89 board and the AV-61 board is defective, or connection between the AV-61 board and the MB-103 board is defective, or connector installation is defective, or AV-61 board is defective.

6. Picture is not normal. (Block noise or others appear.)

The MB-103 board AVD (IC403) or SDRAM (IC404, IC405) is defective, or ARP & SERVO (IC301) is defective.